INDIA RUBBER WORLD

FOUNDED 1889

CAOUTCHOUC Reg. U.S. Pat. Off.

GUTTA-PERCHA Reg. United Kingdom.

Published on the 1st of Each Month by

THE INDIA RUBBER PUBLISHING CO.

DIVISION OF EDWARD LYMAN BILL, INC.

420 Lexington Ave., New York, N. Y. Cable Address: Irworld, New York

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Volume 76 SEPTEMBER 1, 1927 Number 6

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Subscription $3.00 Per Year Postpaid in the United States

$3.50 Per Year Postpaid to All Other Countries

EDITORIALS

Tire's Long Arrested Development

"WHY," asks the *Gummi Zeitung*, "since the original pneumatic or rubber inflatable tire had been patented in England by Robert William Thomson on December 10, 1845, and had been used by him in coach tests in London on March 17, 1847, did it take a lifetime for the idea to penetrate?" It answers its own question about the long dormancy by pointing out that the failure to adopt such tires was not due so much to lack of appreciation of their merit as to the fact that a most important element or essential—good roads—was conspicuous by its scarcity. It is hard to imagine in our day, it says, how wretched was most of the paving, even in great cities, seventy-five years ago. It was mostly of field stones, and yet the public seemed satisfied. Thomson's novelty could not be used because in riding rapidly any car thus equipped would be subjected to most uncomfortable bounding.

Nearly all great inventions seem to require a complementary something to make them usable. The airplane might still be but a mere glider had not a gasoline engine been devised to drive the plane so fast that the air would have to sustain it. Even the automobile's astounding success hinged upon the development of the pneumatic tire, for only the latter could adequately absorb the engine jar and road shock inevitable with increase of speed and vehicle weight. How first the bicycle and next the pneumatic tired motor car have spurred on the movement for smoother and more numerous highways is, of course, familiar experience.

Rubber Industry's Westward Course

ALTHOUGH Kipling holds that the twain East and West may not meet until Judgment Day, a felicitous fusion may be effected much sooner, and largely through American enterprise. So, too, while civilization tends ever toward the setting sun, our rubber manufacturers are striding to the goal, as it were, with seven-league boots; and preparatory to pressing trade and promoting better international relations overseas, they are now entrenching themselves on our western shore. First the rubber goods makers massed near the upper Atlantic coast, next they drifted largely to the near Midwest, even founding a rubber metropolis; and now they are springing across the continent to establish another common center for their activities in the Pacific Southwest.

The Goodyear company pioneered with an immense plant in Los Angeles, and seven years' successful operation has proved the wisdom of its choice. Last May the Goodrich company announced that it, too, was convinced that such location was a strategic one, and already it has begun work on a model factory to cost four millions. Now comes the Firestone company with a seven-million mill project promising to be the last word in capacity and efficiency. And this is only the beginning. Other outstanding leaders, such as the United States and Fisk companies, are also said to be negotiating for huge branch factories in this newer manufacturing territory.

Only very practical reasons have swayed those that have chosen Los Angeles as a basis for major operations. They have seen the city grow amazingly, its population increasing five times as fast as that of the nation, its tourist appeal stronger than ever, yet its industrial expansion being even more marked, until now there are some 200,000 wage earners among its million and a quarter residents. They have noted climatic conditions favoring an all-year-round working schedule, plenty of skilled and semi-skilled labor, cheap and abundant oil, gas, water, and electricity. Cheap and easy canal, oceanic, and railroad transportation, with ideal highways, and nearness to the long-staple cotton fields and closer proximity to the sources of rubber in the Far East are powerful attractions. The largest city west of Chicago has, in short, shown itself to be the logical distributive center for all the states west of the Rockies, for Mexico, western Canada, and the potentially great markets of the Orient.

Grow Rubber in Brazil

A visiting Ceylonese rubber planter wonders "why Americans do not turn to Brazil for rubber growing instead of experimenting in Liberia and other places;" and he contends that the problems of labor, taxation, transportation, etc., should not be insuperable. As well might it be asked why Brazilians seem so heedless of their great opportunity, or why their government, realizing that it cannot unaided undertake large scale rubber cultivation, does not offer inducements to the largest rubber manufacturing country to produce much of its raw material in the vast valley of the Amazon. Indeed, the wonder is that both having so much to gain through such relations do not make an extraordinary effort to soon establish a rubber planting enterprise in the western hemisphere that will vie with the best in the eastern.

* * *

AMERICANS MAY GRIEVE ABOUT BRITISH CONTROL OVER crude rubber prices, but their distress is mild compared with that of the British over American domination of the cinema industry. What also stings like a white-hot brand is the fact that not only are the substantials of Singapore being virtually exchanged for the empty phantoms of Hollywood, but that the British public unpatriotically prefers Yankee films to home-made reels.

Rubber Compounding Practice[1]

Mineral Rubber — General Plasticator for Crude Rubber — Source — Manufacture—Value in Compounding—Importance to the Industry

WEBSTER NORRIS

BREAKING down or plasticating crude rubber is essential before adding the ingredients for mill mixing. Plasticating requires a large expenditure of power, in the case of firm first quality rubbers and if carried to excess distinctly injures the gum by reducing its "nerve" or natural resilient quality.

Crude and compounded rubbers when moderately milled regain practically all of their nerve when allowed to cool and rest for 24 hours. This fact was observed very early in rubber working. As a means for facilitating mixing rubber compositions with the least loss of power, time and quality, the addition of coal tar and other softeners long preceded the use of mineral rubber in the footwear and mechanical goods divisions of the rubber industry. The need for a varied line of softening materials suited to both high and low grade mixings was met by employing the soft resinous wild rubbers, reclaims, and a variety of resins, oils, etc. The most important successor to coal tar, in point of general utility, is mineral rubber or MR.

Mineral rubber received its name because it is an inert plastic hydrocarbon of specific gravity not greatly in excess of that of crude rubber with which it can be mixed in all proportions. It is a mixture of liquid and solid asphaltic hydrocarbons from petroleum refining, and is commercially graded according to its melting point and hardness.

Asphaltic Base Petroleum

Crude petroleum from different oil fields varies in chemical character, some consisting of paraffin bases while others are asphaltic. Still others are mixed paraffin and asphaltic. These are known as semi-asphaltic. The oils of the Appalachian fields of Pennsylvania, Ohio and Kentucky are paraffin oils. The mid-continental field oils of Texas and Oklahoma are semi-asphaltic. From these oils soft mineral rubber of low melting point can be made. Oils obtained from the California and Mexican fields are entirely of asphaltic base and yield mineral rubbers having a wide range of melting points, harder for a specific melting point.

After all the volatile and light gravity oils such as gasoline, paint thinners, kerosene, etc., are eliminated by distillation from asphaltic base oils, the residue in the still is known as "flux oil." It represents about 85 per cent of the original crude and is the liquid base from which MR is made. For this purpose flux oil is always selected from crudes of special oil fields according to the content of liquid asphalts and their inherent adhesive quality. Flux oils from different fields are often used to make MR.

Flux oil of particularly adhesive quality given more or less heat treatment is the so-called rubber flux, used as a softener particularly for unvulcanized rubber products such as adhesive tape.

Gilsonite, a hard bitumen from Utah is dissolved in flux oil in the process of making MR. It is a black, hard, lustrous hydrocarbon of specific gravity 1.10, very pure, elastic and valued for varnish making and for insulation purposes. It is used in varying proportions in MR to give special characteristics of high melting point, hardness and luster.

Making MR

The charge of flux oil from a single field or mixed from various fields is run into a huge jacketed still of many tons capacity and the proper weight of Gilsonite is added. After the materials are raised to 350 to 375 degrees F., according to circumstances, cold air is blown through it to oxidize the mass and raise its melting point to the desired degree. For soft MR this is 280 degrees F. and for hard MR 300 degrees F. The heat generated by the oxydizing effect of the air is sufficient to advance the temperature of the mass up to 500 or more degrees F.

The full treatment of the batch requires a number of hours varying in accordance with the MR product desired. Commercially the grades are soft, medium and hard with melting points of 250, 300 and 340 degrees respectively. When the end point is reached for any desired melting point the material is drawn off into sheet iron drums and cooled ready for shipment.

Certain manufacturers of MR do not blow their product but secure the desired grade entirely by steam distillation.

Temperature control in MR making is a particularly essential feature of the process. Otherwise with a heavy charge in the kettle the stock would be liable to be overheated and burnt locally, causing spotty variations in hardness of the finished product.

The ideal method of processing MR ingredients is by circulation system of oil heated independently. This system is adapted to MR making because it permits close regulation.

The following standard test methods, briefly indicated below, are used for the determination of the hardness and melting point of solid bituminous materials such as MR.

Penetration[2] is defined as the consistency of a bituminous material expressed as the distance that a standard needle vertically penetrates a sample of the material under known conditions of loading, time and temperature. Where the conditions of test are not specifically mentioned, the load, time and temperature are understood to be 100 grams, 5 seconds, 25 degrees C. (77 degrees F.) respectively, and the units of penetration to indicate hundredths of a centimeter.

Melting Point Test

The softening[3] of bituminous materials takes place at no definite moment or temperature. As the temperature rises, they gradually and imperceptibly change from a brittle or exceedingly thick and slow flowing material to a softer and less viscous liquid. For this reason the determination of the softening point must be made by a fixed, arbitrary and closely defined method if the results obtained are to be comparable.

By the ring and ball method a steel ball 3/8 inch in diameter rests upon a sample under test which is supported in a ring immersed in the heating medium at a definite distance from the bottom of a beaker. Water is used for materials softening at 176 degrees F. or below and glycerine for those softeningabove 176 degrees F. The temperature is raised at the specific rate of 9 degrees F. each minute. The temperature recorded by the thermometer at the instant the bituminous material touches the bottom of the glass vessel is reported as the softening point.

There is a second method of test known as the "Cube-in-Water Method." As the former is preferred for determining the melting point of MR reference only is given.[4]

[1] Continued from THE INDIA RUBBER WORLD, July 1, 1927, pp. 187-188.

[2] "Standard Method of Test for Penetration of Bituminous Materials," Serial D5-21. A. S. T. M. Standards, 1924, pp. 944-946.

[3] "Standard Method of Test for Softening Point of Bituminous Materials." (Ring and Ball Method.) Serial D36-24. A. S. T. M. Standards, 1924, pp. 955-959.

[4] "Standard Method of Test for Softening Point of Tar Products." (Cube-in-Water Method.) Serial D61-24. A. S. T. M. Standards, 1924, pp. 960-964.

Comparison in a Test Mixing

In the selection of MR for a given class of rubber work, comparisons of samples should be made on a suitable test mixing. The following is suggested by a manufacturer of MR.[5]

MINERAL RUBBER TEST FORMULA

Smoked sheets	100.00
Zinc oxide	25.00
Carbon black	27.00
Sulphur	5.00
Hexa	0.65
Mineral rubber	8.00

Test samples of this mixing are given a rising press cure of 20 minutes at 45 pounds of steam.

Comparison of 16 different samples of MR compounded on the above formula showed wide differences in their influence on tensile properties before and after accelerated aging, also in the hardness of the cured samples and their resistance to tear and abrasion.

compounders get along with the 300 degree grade. Where a wide variety of goods is produced it is well to have available a stock of each grade in order to attain full advantage in compounding. Selection of the best grade of MR for a given compound is made on the basis of tests bearing on the special characteristics desired in the product. In general, the adaptability of soft, medium and hard MR is about as follows:

Soft MR, in frictions, boot and shoe uppers and thin gage calendered work and proofing. Medium MR, in general calendered work, auto topping and general mechanical rubber goods. Hard MR, in abrasive wear resisting stocks such as tire treads, solid tires, covers of hose and belting, matting, dark colored tiling, heels, etc.

Mineral rubber with high melting point and relative hardness by penetration test, when used in rubber compounds, gives best tensile, abrasive, and aging qualities, due to the fact that less

Compounds Illustrating the Use of MR

NON-BLOOMING BLACK HEEL

Whole tire reclaim	28.00
Solid tire reclaim	22.00
Ground vulcanized scrap	22.00
MR. 340° m. p.	15.00
Whiting	10.50
Lime	1.75
Sulphur	0.75
	100.00

Cure, 12 minutes at 45 pounds.

CODE WIRE INSULATION

Rubber	6.0
Tire reclaim	40.0
MR. 340° m. p.	24.0
Whiting	24.0
Litharge	3.5
Sulphur	1.5
Paraffin	1.0
	100.0

Heater cure, 30 minutes to rise to heat, followed by 90 minutes at 240 degrees F.

BLACK SHEET PACKING

Smoked sheets	20.0
Solid tire reclaim	12.0
Asbestine	45.6
MR. 340° m. p.	13.0
Litharge	5.0
Sulphur	2.5
Gas black	2.5
	100.0

Press cure, 20 to 30 minutes at 45 pounds.

TIRE BEAD FLAP FRICTION

Amber crepe	12.00
Floating inner tube reclaim	35.00
Tire carcass reclaim	15.00
MR. 300° m. p.	8.00
Litharge	6.00
Lime	1.50
Whiting	15.00
Rosin oil, medium heavy	3.50
Sulphur	4.00
	100.00

Cure 45 minutes at 40 pounds.

HEEL FOR RUBBER BOOT

Smoked sheets	6.00
Amber crepe	6.00
Shoe reclaim	16.00
Vulcanized ground black waste	16.00
Whiting	36.00
MR. 340° m. p.	15.00
Litharge	4.25
Sulphur	0.75
	100.00

Preliminary mold cure, 15 minutes at 45 pounds.

WATER HOSE COVER

Amber crepe	10.00
Shoe reclaim	50.00
Brown factice	5.00
Whiting	16.00
MR. 300° m. p.	5.00
Litharge	2.50
Cotton fiber	10.00
Sulphur	1.50
	100.00

Cure, 1½ hours at 45 pounds.

MATTING

Floating inner tube reclaim	10.00
Shoe reclaim	50.00
Whiting	22.50
Litharge	7.50
MR. 250 m. p.	8.00
Sulphur	2.00
	100.00

Press cure, 20 minutes at 45 pounds.

WATER HOSE FRICTION

Guayule	8.0
Floating inner tube reclaim	50.0
MR. 250 degrees m. p.	6.0
Whiting	24.0
Palm oil	1.0
Stearic acid	1.0
Litharge	7.0
Sulphur	3.0
	100.0

Cure, 1½ hours at 45 pounds.

In this series the best original tensile was 3,627 pounds per square inch and the poorest 2,964 pounds. On aging 14 days in the Geer oven these samples showed tensiles of 1,463 and 758 pounds per square inch respectively. Compared on a percentage basis the poorer sample showed only 51.8 per cent of the value of the better one.

MR in Compounding

MR is beneficial to rubber compositions by contributing a number of valuable characteristics to the product namely: (1) increase of plasticity; (2) increase of waterproofing effect; (3) increase of resistance against acids; (4) improvement of aging quality; (5) improvement of tensile properties; (6) cheapest volume cost-reducer without impairing the rubber quality.

It is most conveniently used in granular form which promotes the facility of both weighing and rapid absorption of the material in mixing. As soon as the crude rubber or reclaim is broken down sufficiently to hold together and surrounds the mill roll, the MR should be added in broken form rather than in large masses. The working temperature quickly softens the material which blends readily with the gum making a smooth plastic base for reception of the earthy powders.

Three grades of MR are made for rubber work variously known by brand names or simply as hard and soft MR or hydrocarbon. All are essentially of the same specific gravity, namely, 1.10 but differ in melting point. The grades are: soft, m.p. 250 degrees F.; medium, 300 degrees F.; hard, 340 degrees F. Many volatile constituents are contained in such mineral rubber at the workable temperature range.

The percentage of sulphur and carbon is given consideration as they definitely affect rubber compounds. The carbon content of a mineral rubber is most important, especially the free carbon, not so much as to its quantity as to its quality. All the carbon must be in the amorphous and not the crystalline form, because naturally, the crystalline form does not make a smooth compound and will cause blowouts in electrical stocks and is very undesirable in calendered stocks.

Standard Specifications

A specification sheet for MR of desired standard should cover the following points: Melting points (cube method or ball and ring method); Penetrations, at 77 degrees F., 122 degrees F., 168 degrees F., (using 100 g. load); Solubiity tests, (in carbon bisulphide and carbon tetrachloride); Acetone extract; Fixed carbon; Combined sulphur; Volatile loss at 325 degrees F. for 5 hours; Penetration test on the residue; Volatile loss at 450 degrees F. for 5 hours; Penetration test on the residue.

The effect of MR in rubber compounding is discussed at length by C. Olin North.[6] The results of North's investigation were summarized by him as follows:

MR has a beneficial effect on the physical properties of rubber

(*Continued on page* 332)

[5] H. H. Robertson Co., Pittsburgh, Pa.

[6] "Mineral Rubber," a paper read before the Rubber Division of the American Chemical Society, New York, N. Y., September 6-10, 1921. THE INDIA RUBBER WORLD, December, 1921, pp. 191-192.

Doubling the Yield Per Acre on Hevea Rubber Plantations

Research Department of United States Rubber Plantations reports 1,000 *Pounds Rubber Per Acre a Possibility—Effects on Future Extension of Rubber Acreage—Valuable Planting Data*

WHAT is believed to be the most important announcement of recent years relative to plantation rubber comes from the research laboratories of the United States Rubber Plantations, Inc., Sumatra. It has to do with increasing the yield of rubber from an average of about 450 pounds to 1,000 pounds to the acre. This 100 per cent increase is produced by means of bud grafting with buds from previously proven high yielding trees. The research laboratories of this pioneer American rubber plantation company have been at work on this problem for the past decade and its announcement can be accepted as thoroughly reliable.

View of Budded Hevea Trees Showing Soil Conservation and Silt Pits

The story of the careful planning and research back of this announcement is in line with all modern scientific achievement. Ten years ago it was a dream to double the production by increasing the yield per acre rather than by doubling the acreage to be planted. The work started in Java, was taken up by the various government experiment stations, by the A. V. R. O. S. (the official rubber growers' station of Sumatra) and by private research laboratories. Many preliminary studies on the botany of the Hevea rubber tree had to be made so as to square the research with the most advanced scientific knowledge. Many previous announcements from private sources as to the possibility of increasing the yield of each tree by selective and bud graft methods were not backed by sufficient investigation. But now that the United States Rubber Plantations announces its results, there can be no longer any doubt; for their research department is one of the best of such scientific establishments in the Far East.

An Interesting Comparison

It may interest Americans to know something of the size, activities and personnel of the United States Rubber Plantations, Inc. Of the capital invested in rubber plantations in the Orient, (about $880,000,000) that represented by American companies (about $30,000,000) is less than 4 per cent. Of this capital, that which represents investments of the United States Rubber Co. is greatest.

The planted area of this American company comprises 82,583 acres, of which about 52,000 acres are in bearing. Yet, owing to more favorable natural factors, such as soil, topography, and rainfall and to a policy of rigid scientific control and prudent management, this production from the United States Rubber Co.'s plantations is equal to that of all South India and Burma whose area, 101,389 acres in bearing is twice as large as that of the American company. The difference is explained by the average yield per acre, which is 450 pounds for the American holdings as compared with less than 230 pounds to the acre for British India estates. This does not include Ceylon and Malaya. Another fact is that to harvest the same amount of rubber requires a labor force of 22,392 employes on the United States Rubber Co. estates as against 48,383 for British India including Burma.

These facts are mentioned here because of their bearing on the subject of production costs and yields per acre. In the more intense competition for a share of the consumer's dollar emphasis is being placed more and more on lowering production costs so as to increase consumer demand. The normal course of industry depends for its progress on continuous increase in consumption based on continued increase in production *at lower costs*. One means to reduce production costs is by increasing the yield of rubber per acre. As in all industry today, progress in solving the new problems is made through scientific research. The United States Rubber Co., from its beginning as a rubber grower, established a research laboratory, one division of which determines and controls the planting policies of the organization. At the present time the plantation research department consists of a director, two botanists, three foresters, and a chemical staff. The cumulative experience of this department combined with that of many other scientists is responsible for the remarkable achievement of doubling the average yield per acre. This is equivalent to doubling the planted acreage and means a tremendous saving in production costs. To get a more concrete idea of what this means it is helpful to refer to the figures previously mentioned which compare yields per acre and number of employes for British India and the United States Rubber Plantations, respectively. This result is bound to influence future plantation policies and rubber growing developments in all countries. More rubber will be absorbed as it comes on the world market.

The Research Story

The story of the introduction of the plantation rubber tree, *Hevea brasiliensis*, into the East from the seeds obtained by Wick-

ham in Brazil is familiar to everyone. It is believed these seeds represented about 17 varieties of Hevea. Of 70,000 seeds, only 2,700 germinated and about 1,900 seedlings were received at Heneratgoda, Ceylon, on August 12, 1876. In 1877 Ceylon sent 22 trees to Singapore. These bore seeds in 1881, and were the source for plantations in Malaya and Borneo and later Sumatra.

Early observers frequently pointed out the unequal yields obtained from different rubber trees. Accurate measurements were finally made to record these variations. It was found, for example, on one large representative area that 50 per cent of the poorest yielding trees gave only 30 per cent of the yield. In some instances these proportions were even more unfavorable. Tests then determined that the best yielders were best consistently and owed their advantage to a larger number of latex vessels. Hence arose a system to locate and record the trees on an area which gave the highest yield. Several years' observations and considerable work of collecting and verifying the records preceded the present system of bud grafting.

A close enough approximation between the number of latex vessels in the bark and the yield, at first served to determine the best yielders. These best trees were then used as mother trees from which buds are obtained to use for grafting on to young seedlings with the purpose of reproducing the high yield characteristics of the mother tree. This is the system known as budding, and is used widely in our fruit and nut plantations, to propagate the best varieties.

Rubber Yields from Bud Grafting

The best scientifically controlled experiments on budding and seed selection in Sumatra are of the United States Rubber Plantations, Inc.

The oldest buddings on one division, are eight years old. These gave yields during the past year averaging 12.2 pounds per tree; the limits being 10.1 pounds and 16.9 pounds. Some of the younger bud grafts on this same division are now in ordinary tapping and they give every indication of yields greater than those of the older grafts. Think what this means. If the stand of trees is put at 100 to the acre, the yield per acre will easily exceed 1,000 pounds. The average yield now for Malaya is around 350 pounds to the acre; and for Sumatra, about 330 pounds.

Buddings have not yet passed the test of tapping on renewed bark. From present appearances there is no need to have misgivings on this score. It seems highly probable that some system of tapping much better suited to buddings will have to be evolved. Experiments are now in progress to determine this point.

Tapping System and Bark Renewal

No single operation on a rubber estate is more important than tapping; and with tapping we include the tapping system which gives the tree a rest sufficiently long to insure an adequate renewal of bark on the tapped surface. The United States Rubber Plantations, Inc., has conducted elaborate experiments for many years with different tapping systems. It is to be expected that tapping on buddings would receive special attention. And we learn from its research department that this is so.

Buddings tapped with a double cut on one half the circumference, alternate fortnightly tapping, gave an increase of 11 per cent in yields over the alternate monthly tapping system. Another experiment with two cuts as against one cut gave only a slight increase in favor of two cuts. A point that is brought out strongly is the danger of relying on results obtained from too small an area. For example, results from experiments on a few trees are not likely to be duplicated when several hundred or several thousand trees are involved. From the experience of this company at least, it is concluded that the half cut alternate month tapping system with six years' renewal period has proved more satisfactory thus far than all others. No advantage is derived in giving a longer renewal period than six years. In fact, a five-year renewal in young rubber is recommended and a six year renewal in older rubber with alternate monthly tapping remains the standard system. This system may apply to buddings, with but slight modifications; but the last word on tapping systems for buddings must await further experimentation.

Seed Selection Areas

One experiment deals with yields from selected seedlings compared with yields from buddings. The first year's tapping on one area gave a yield of 287 pounds per acre for the buddings against 181 pounds per acre for selected seedlings. The second year tapping will, it is estimated, show a yield of over 500 pounds per acre for the buddings. Such an amount per acre is now obtained only on the best areas in fully matured 10 year old trees, and is considered very exceptional. This again speaks very well for buddings.

Two small areas planted in 1920 with buddings gave yields of 388 (a very slow growing section) and 669 pounds per acre respectively for 1926, as against 487 and 474 pounds per acre over two considerably larger areas of selected seed, and 487 pounds per acre for another area of selected seed, planted at different densities.

While these yields from selected seed are lower than those from buddings, they are much better than the yields from unselected seed in the first year of tapping. The conclusion is drawn that from data now available it seems probable that the yield from selected seed planted at least 200 to the acre and thinned by test tapping is about equal to the yield of mixed buddings of unproved origin.

The research department has tried to obtain seed by artificial pollination. While some success attended these efforts, the percentage success has been too low to prove of interest.

Thick Planting Systems

Tests were made with planting at different densities, ranging from 196 to 416 trees to the acre with selected seed as compared with the original system of 120 trees to the acre. After thinning to a uniform 100 trees per acre at six years old the yield per tree is about 10 per cent greater in the more densely planted areas. This is in spite of the suppressive effect on growth due to the dense planting and is attributed to the proper selection exercised.

Up to now there appears little difference between the various densities of planting from 196 to 416 trees. The tendency seems to be for the highest yields per tree to be given by the plots planted 350 trees per acre. The provisional conclusion is drawn that between 200 and 300 trees per acre are advisable when planting with selected seed or seed from buddings. A policy of planting 150 buddings plus a reserve of 150 selected seed with subsequent selective thinning by test tapping is being followed for the present.

Replanting Old Areas

The question of replanting older areas with buddings and selected seed is receiving much attention from the management. Preliminary experiments indicate that enhanced yields will be the reward for replanting. However, the question is there of determining how soon the loss of production from these already producing areas could be made up in the years of redevelopment. But it does seem that with the splendid results from budding and with the proper fertilizing program it will be possible to adopt a policy of gradual replanting of all the older less productive areas. Where root disease has destroyed a large percentage of trees there ought to be but little hesitancy to replant with proven high yielding stock.

Rubber planting it seems is now entering a new phase. In the feverish haste in which millions of acres were planted in the early days of the plantation industry, many mistakes were unavoidable. It was a new venture. Technical skill and scientific principles were lacking. But now the spirit of scientific research is slowly pervading the councils of those who have most to lose or gain by the fortunes of the industry. And the generous policy of research that has characterized the plantation development of the United States Rubber Co. in Sumatra will more than be justified in the new era of scientifically sound rubber planting where guess work is eliminated.

Conic Sections and Volume Cost Compounding

The illustrations in this paper are entirely from the rubber industry but are equally applicable to other industries such as paint, varnish and plastics generally

W. B. WIEGAND, M.A., F.C.I.C., F.I.R.I. AND H. A. BRAENDLE, M.A.

THE following abridgment omits much of the mathematical discussion but retains the more practical applications covered in the author's original paper.[1]

It is generally recognized that the composition of a rubber article must be considered, and the properties of each ingredient known, on the basis of the volume percentage present, as well as on the weight percentages, also that since by far the great majority of rubber goods are sold by units and not by weight, the volume cost of a rubber compound is the decisive one. Since, however, in actual factory operations, weights, and not volumes of the various ingredients are measured out, it is very difficult to avoid the ultimate description of compound changes in terms of weight units.

A frequent, one might almost say daily, problem of the rubber compounder is to find out the effect on volume costs of changes in the amount and nature of the various compounding ingredients. "What will be the effect of replacing 5, 10 or 20 per cent of whit-

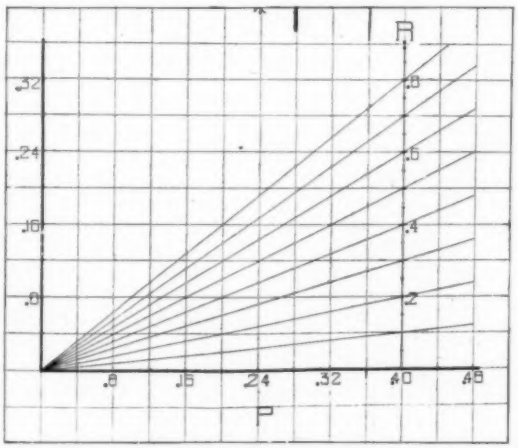


Chart for Determining Changes in Volume Cost of Compounds Due to Substitution

ing by the same or different percentages of clay or any other ingredient?" "For which compound will a certain change result in economies and for which otherwise?"

In practice, such problems are variously handled. Some attempt to carry out all formula changes in terms of volume units. In this case the original formula is recalculated to the volume basis, and compound changes and substitutions are effected in terms of volume units. This method, useful enough in some respects, nevertheless requires the recalculation of the modified formula back to weight units before it can be applied in the works. This all too frequently results in awkward fractions which complicate the weighing out in the compound room. In any case, the solution of the "volume" costs problem usually takes the form of numerous trials with as many requests to the cost department for the new figures. We have therefore attempted, by applying simple analytical treatment, to work out some readier and more precise means of arriving at volume cost relationships directly in terms of weight units, so as to eliminate the extra step of transformation into volume units followed by restoration to weight units. Various typical ingredient substitutions are worked out first algebraically and then graphically as follows:

Let Weight of original batch be $W_o = 1$
Volume of original batch be V_o
Pound cost of original batch be L_o (cost per kilogram)
[2]Pint cost of original batch be P_o (cost per litre)
Gravity of original batch be G_o
Batch cost of original batch be B_o

$$\text{Hence } \frac{1}{V_o} = G_o = \frac{P_o}{L_o}$$

$$\text{and } L_o = B_o = V_o P_o$$

Taking the simple case of the substitution of one ingredient for another, let us remove—

a pounds of ingredient N
having a pound cost of l_n
having a pint cost of p_n
and gravity of g_n
which we replace by—
b pounds of ingredient X
having a pound cost of l_x
having a pint cost of p_x
and gravity of g_x

Then—

$$W_2 = 1 - a + b$$

$$V_2 = \frac{1}{G_o} - \frac{a}{g_n} + \frac{b}{g_x}$$

$$G_2 = \frac{1 - a + b}{\frac{1}{G_o} - \frac{a}{g_n} + \frac{b}{g_x}}$$

$$L_2 = \frac{L_o - a l_n + b l_x}{1 - a + b}$$

$$P_2 = \frac{L_o - a l_n + b l_x}{\frac{1}{G_o} - \frac{a}{g_n} + \frac{b}{g_x}} \qquad \ldots\ldots(1)$$

The above equations represent the general relationships resulting from the substitution of one ingredient for another. In this discussion, however, we are interested principally in the volume cost relationships and so shall discuss various cases of the problem from that angle.

Case I. General. Where P_o is not equal to P_2 and a is not equal to b.

For this case we have equation (1) above, viz:

$$P_2 = \frac{L_o - a l_n + b l_x}{\frac{1}{G_o} - \frac{a}{g_n} + \frac{b}{g_x}}$$

Case II. General substitution ratios for unaltered volume costs. Where P_o equals P_2 and a is not equal to b.

Here—

$$\frac{a}{b} = \frac{(P_o - p_x g_x}{(P_o - p_n) g_x} \qquad \ldots\ldots(2)$$

which is the equation of a rectangular hyperbola and affords a ready solution of individual problems.

[1] *Kautschuk*, June, 1927, pp. 204-7.

[2] One pound volume of water occupies 1 apothecary's pint. We shall therefore employ the term "pint" because of its brevity, and also because of its direct suggestion of the volume concept.

Case III. General effect of direct substitution on volume cost of compound. Where P_o is not equal to P_x but a = b.

$$\therefore P_x = \frac{L_o - a\,(l_n - l_x)}{\frac{1}{G_o} + aR} \quad \ldots\ldots(3)$$

$$\text{When } R = \left(\frac{1}{g_x} - \frac{1}{g_n}\right)$$

Rearranging, the above reduces to—

$$P_x\,a + \frac{P_x}{G_o R} + a\,\frac{(l_n - l_x)}{R} - \frac{L_o}{R} = o \quad \ldots\ldots(4)$$

which is again the equation of a rectangular hyperbola referred to axes parallel to, but not coincident with, its asymptotes. In any given case, P_x can be conveniently arrived at by solution of equation (3).

Case IV. Conditions for unaltered volume cost after direct substitution by weight. In this case $P_o = P_x$ and a = b.

Mathematically, Case IV derives very simply from either Case II or Case III by introducing the respective additional limitation.

Otherwise, we have

$$P_x = P_o = \frac{L_o - al_n + bl_x}{\frac{1}{G_o} - \frac{a}{g_n} + \frac{b}{g_x}}$$

$$\therefore P_o\left(\frac{1}{G_o} - \frac{a}{g_n} + \frac{b}{g_x}\right) = L_o - al_n + bl_x$$

$$\therefore al_n - bl_x = P_o\left(\frac{a}{g_n} - \frac{b}{g_x}\right) \text{ and since } a = b$$

$$l_n - l_x = P_o\left(\frac{1}{g_n} - \frac{1}{g_x}\right)$$

Again, put $\left(\frac{1}{g_x} - \frac{1}{g_n}\right) = R$

$$\therefore (l_x - l_n) = RP_o \quad \ldots\ldots(5)$$

From this equation it is seen that a linear relationship exists between the poundage cost differential of the two pigments and the volume cost of the original (and in this case also of the resultant) compound. The slope of this line is determined by the difference in specific volume of the pigments. Since "a" does not appear, the extent of pigment substitution does not influence the above relationships. It also follows that:

(a) In the case of the direct substitution of a lighter but costlier pigment, there is a critical value for the volume cost of the original compound below which the substitution will increase costs; at which, leave them unaltered; but above which effect progressively increasing economies.

(b) For any value of P there is a definite premium which may be paid for the lighter pigment.

(c) Conversely, when the substituting pigment is the heavier, there is for every value of P a definite amount by which the pigment introduced must be cheaper than the pigment removed.

(d) It will now be shown that in graphic form this equation yields in advance a wide range of qualitative information as to the effect on volume costs of any projected ingredient substitutions.

The graph presented herewith illustrates equation 5. The values for R include the commonly met with range. We now give practical applications of this graph.

Example 1. Given a white soling of volume cost = .32 per pint in which we wish to substitute lithopone for zinc oxide, if all or part of the zinc oxide is replaced by the same weight of lithopone, what will be the effect on the volume cost?

First get value for R = 1 ÷ 4.2 — 1 ÷ 5.6 = .238 — .178 = .06. Lay rule from origin through the point .06 on "R" scale. Then for each value of original volume cost, we can read off directly the permissible premium that may be paid for the lithopone over zinc oxide to leave volume cost unchanged.

In the above case (P_o = .32) we can substitute lithopone without change in cost if its cost is .0185 per pound greater than the zinc oxide. If the premium exceeds this the cost will go up, and vice versa.

Example 2. With market prices of zinc oxide and lithopone fixed, when will direct substitution save money, and when not?

Suppose zinc oxide costs .075 per pound and lithopone .095 per pound then $l_x - l_n$ = .02, and R = .06 as before.

Again trace or draw the line for R = .06. The abscissa of the point on this line for .02 is seen to be .34, which gives the volume cost for which substitution is without effect on volume cost.

In dearer compounds, there will be a saving and in cheaper compounds an increase in volume cost.

Example 3. What price can be profitably paid for a low gravity reclaimed when replacing rubber pound for pound?

$$\left.\begin{array}{l}\text{Take rubber at .40 and } G = .93\\ \text{Take reclaimed at ? and } G = 1.10\end{array}\right\} R = -.085$$

Draw line as before. Then for compounds costing .35 we could, so far as volume costs are concerned pay .40 — .03 = .37 per pound. But for compounds costing only .10, the figure comes to .40 — .008 = .392 per pound.

We thus reach the rather unexpected conclusion that from the point of view of volume cost alone, the economical price limit for a reclaimed stands in inverse ratio to the volume cost of the compound under consideration. This follows directly from the fact that, R being a constant, $(l_x - l_n)$ is directly proportional to P_o.

Perhaps these cases will suffice to illustrate the applicability of the graphic form of Equation 5. Its chief utility would appear to be the clear-cut demarcation of compounding changes which will increase costs from those which will lower costs. Hitherto, such problems have required the "cut and try" cooperation of the cost department of the works, various substitutions being made until some one of these efforts results in the desired cost. A little practice with the graph will, we think, quickly establish its utility and speed.

Legal Decisions

Driving Belt. Patent No. 1,611,829, ex parte Freedlander. The applicant appeals from the decision of the Examiners in Chief affirming that of the Primary Examiner denying patentability to claims 7 to 12, inclusive, of which claim 7 will serve for illustration purposes and is as follows:

7. A driving belt comprising a compression member composed of rubber mixed with fiber and having corrugations on the inner surface, a central member composed of rubberized cord fabric, and a tension member composed of rubberized fabric cut on the bias, the material of the central member being laid on the compression member and that of the tension member on the central member.

The decision of the Examiners in Chief affirmed.—*Official Gazette*, Volume 360, page 499.

Driving Belt. Patent No. 1,611,830, ex parte Freedlander. The applicant has appealed from the decision of the Examiners in Chief affirming that of the Primary Examiner denying patentability to claims 1 to 4 inclusive, and claim 7. Claims 1 and 2 will serve for illustrative purposes and are as follows:

1. The herein described method of making a driving belt, consisting in fabricating material therefor of vulcanizable soft rubber mixed with fiber; in winding such material on a suitable instrument into the form of a roll; and in vulcanizing such roll.

2. The herein described method of making a driving belt consisting in fabricating material therefor of vulcanizable soft rubber mixed with fiber, the strands of which are placed substantially crosswise such material; in winding such material upon a suitable instrument to form a roll of belting; and in vulcanizing such roll.

The decision of the Examiners in Chief affirmed as to claims 1, 3 and 7 and reversed as to claims 2 and 4.—*Official Gazette*, Volume 360, page 747.

Patent Suits

1,068,691, J. G. Moomy, patch for rubber articles, filed July 27, 1925, D. C. Ind. (Indianapolis), Doc. 937, J. G. Moomy v. G. & J. Tire Co. Dismissed May 9, 1927.—*Official Gazette*, Volume 360, page 501.

Water Bag Curing of Cord Tires

ERNEST BLAKER and J. W. SCHADE
Laboratories of The B. F. Goodrich Co., Akron, Ohio

THE uniform curing of any rubber article such as a tire involves the transfer of heat to the article in such a way that each part will be raised to the necessary temperature to cause proper vulcanization within a given time.

Heating of a material may take place by any one of three ways or by a combination of them: (1) by radiation, whereby heat is transferred to a body through space from the heat source; (2) by convection, whereby liquid or gas, heated by contact with the source, moves to the body and gives up heat on contact with it; (3) by conduction, whereby those particles of a body not in contact with the source of heat are warmed by transfer of heat from particle to particle through the body without change in the relative position of the particles.

All three of these methods of heat transfer are used in rubber factories. Drying rooms heated by steam coils illustrate heating by combined radiation and convection, and curing of tires in molds is an example of conduction heating.

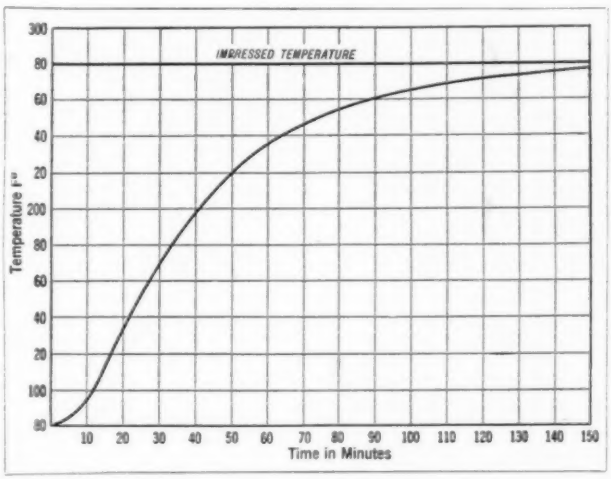
The quantity of heat transferred by conduction depends upon several things, namely: the time of heating; area exposed; the temperature difference between the source of heat and the body heated; and the thickness of the layer of material heated. The amount of heat transferred under any fixed conditions depends upon the character of the material and is proportional to its conductivity. The conductivity of a substance may be expressed as the number of heat units transferred between faces a foot square and one inch apart in one hour when the difference of temperature between the two faces is maintained at one degree F. Other units have been devised but the one defined is commonly used.

When a body is being heated the rate of heating depends not only upon the conductivity but also upon the amount of heat required to raise the temperature of its parts, that is, upon its heat capacity. The latter item for a given material is expressed by the product of its density and specific heat. The property comprising the conductivity and heat capacity is called "diffusivity." The diffusivity of different materials increases as their conductivities increase, and decreases as their heat capacities increase.

In general, pure rubber is a poorer conductor than compounded rubber, but the most highly conducting rubber compounds are much poorer conductors than metals. For purposes of comparison a few conductivities and diffusivities, expressed in the units given above, are here tabulated in British thermal units.

Material	Conductivity B.T.U.	Diffusivity F.T.U.
Crude rubber	1.1	2.4
Compounded rubber	1.9	8.4
Sulphur	1.8	5.2
Zinc oxide	4.9	7.0
Copper	2640.0	3135.0
Steel	310.0	331.0
Lead	238.0	676.0
Water	4.0	4.0
Pine	0.7	4.0

Excepting for thin sheets, it requires considerable time to heat rubber compounds throughout the masses to impressed temperatures. For example, if a slab of a certain rubber compound one-half inch thick were put into a platen press, the plates of which being at the desired curing temperature, it would require fifteen minutes to bring the center of the slab up to temperature, while if the heat were supplied from one side only, the time required would be sixty minutes. If the slab thickness were one inch, when heated from both sides it would require sixty minutes to reach the impressed temperature. It is readily seen, therefore, that a slab heated for a time sufficient only for the center just to reach the impressed temperature receives a very different heat treatment at the center than near the surface. This is shown graphically in the accompanying curve.



Temperatures at Center of Slab Two Inches Thick Heated from Both Sides—Initial Temperature 80 Degrees F.—Impressed Temperature 280 Degrees F.

The old type of tire, made of square woven fabric and called a fabric tire, was built on a metal core from which it was not removed until after curing. On account of the great conductivity and diffusivity of the core in comparison with the tire itself, heat was applied to both sides of the tire and the center soon reached the curing temperature, even in the tread where the tire was thickest.

To give the cord tire its most valuable properties it is necessary to cure it on an extensible bag which is expanded during the curing process. The thickness of this bag, which is made of rubber compound, is in many cases comparable with the thickness of the tire itself. There are in general two methods of curing cord tires. One method, until recently the usual one, is to apply sufficient internal air pressure within the bag to force the tire out against the mold. In this method the entire heat applied to cure the tire is supplied from the mold through the outer surface of the tire. In order to bring the inner plies of the tire up to a temperature at which they will cure, not only must the tire be heated but also the rubber bag.

It is easily seen that the heat treatment of the different regions of the tire is not the same, especially in the thickest portion under the tread. Even were it possible to get air into the bag in the preheated state, its heat capacity is so small as to be ineffective as a heating medium. For a certain size tire of a large production the relative heat capacities of hot water and air in the bag are as 300 to 1. That is, for a given drop in temperature the air will give up about a third per cent as much heat as the water.

These considerations led The B. F. Goodrich Co., at the very beginning of its production of cord tires in the fall of 1910, to adopt a type of cure in which heat would be supplied from within as well as without the tire, thus securing a much greater degree of uniformity of heat application. Initially this result was obtained by filling the bags with hot water at a hydraulic pressure sufficient to force the tire against the mold surface, not only knitting the various parts of the tire firmly together but also forming the tread

design and the lettering on the side of the tire. The water in giving up heat to the bag and thence to the tire must drop in temperature. In order to minimize this temperature drop, the cure was subsequently changed some years ago by admitting steam to the bag for a certain time during the first part of the cure. The steam inside the bag is maintained at uniform pressure in order to keep the temperature constant. This result obtains even though condensation takes place since the bag is connected to the supply line through the stem and manifold inside the vulcanizer. At the temperature at which steam is admitted to the bag the heat supplied is approximately 880 B. t. u. per pound condensed. At the proper time hot water is introduced into the bag under the necessary hydraulic pressure to form and consolidate the tire. The heat derived from this water produces much more nearly uniform temperature distribution throughout the tire and especially in the carcass early in the curing process.

Another advantage of the combination steam-water internal cure is that leakage of steam through the connections adds only to the steam applied externally to the molds, while leakage of water at the temperature of the external curing steam, or slightly above it, simply drops to the bottom of the vulcanizer and passes out with the condensed steam producing no disadvantageous effects. Air, or other gas which may be used in the bags, leaking into the vulcanizer is likely to produce local air pockets and when mixed with the steam reduces the rate of heat transmission to the molds, due to the low conductivity of the gas film formed on them when the steam in the mixture condenses. The presence of 5 per cent of air in steam will reduce the rate of heat transfer as much as 27 per cent[1]. The presence of air in the vulcanizers leads to local or general undercuring and widely variable cures from tire to tire or even in a single tire.

Comparison by means of thermo-couple measurements of the temperatures directly under the tread and above the inner ply of fabric during the curing of fabric and of cord tires discloses some interesting facts. The maximum difference in temperature between these two regions during the curing of a fabric tire on a metal core was 16 degrees F. This decreased as the cure progressed and at the end of the process was only 2 degrees F. In curing a cord tire of the same size and thickness with steam and water in the bag the maximum difference was found to be 24 degrees F. and the difference at the end of the cure 6 degrees F. By the use of air in the bags these temperature differences after the same time intervals increased to 42 and 16 degrees F., respectively. A comparison of the time necessary to bring the average carcass temperature of cord tires to a definite maximum was found, when air is used, to be 154 per cent of the time required for steam and water.

It is seen, therefore, from these data that the combination of steam and water in the bags gives not only greater uniformity of temperature, and hence of curing throughout the tire, but also greatly reduces the time of curing cord times. Another advantage of using a steam-water combination in curing is that it is possible by proper operation practically to eliminate the air from the bags thus reducing to a minimum deterioration due to oxidation.

It has been claimed that bags inflated with gas can be used for a greater number of heats than bags used with steam or water. This may be true of bags designed for use with air or other gas, but by constructing the bags of a composition properly designed to resist water and steam, the number of heats secured from a bag will be as large as or larger than from bags in which gases are used thus securing full economy in service.

[1] *Journal of Industrial & Engineering Chemistry*, Vol. 12, No. 7, p. 644.

WERE MAXIM-TYPE SILENCERS PUT ON FACTORY MACHINES, it is claimed workers would be happier and output increased. This idea strikes a responsive chord among rubber goods makers, who are ever striving to lessen noise or make shop hum more musical; and even though some old mill "crackers" may mimic artillery, they are at least helping to make a material indispensable for the world's quiet and comfort.

Thermlo-F

Thermlo-F is a special accelerator developed to meet every requirement involved in the safe production of short cure molded inner tubes. This accelerator allows calendering without scorching and will not react until the proper amount of flow takes place to completely fill the mold and make a perfect seam. After this point is reached Thermlo-F acts very rapidly and effects maximum production from each molding unit. Should the tube be held in the mold considerably longer than the requisite curing time the accelerator will not cause over curing. It freely fluxes with rubber on the mill, does not run off at the ends of the rolls and is neither poisonous nor in any way obnoxious. Thus it meets every requirement of modern short cure practice.

The advantages of Thermlo-F are shown in the tests given below on inner tube stock of the composition following:

SHORT CURE MOLDED INNER TUBE

Smoked sheet	71.17
Blanc fixe	17.80
Zinc oxide	4.27
Sulphur	1.78
Color	1.42
Cumar resin	1.42
Anti-oxidant	0.71
Paraffin	0.35
Thermlo-F	1.08

Stock of this mixing can be cured in 5 minutes at 287 degrees F. and is not seriously overcured in 10 minutes at the same temperature.

Its physical properties are as follows:

Cure	Per Cent Stretch	Per Cent Set	600 Per Cent Elong.	Pounds Per Square Inch Tensile
5 minutes at 287° F.	880	15	850	3,548
10 minutes at 287° F.	890	15	900	3,458

GEER AGING OVEN TESTS

Days aged	0	4	6	8	10
Tensile	3,586	3,872	3,242	3,253	2,938

BOMB AGING—60 DEGREES C., 300 POUNDS OXYGEN PRESSURE

Days aged	0	4
Tensile	3,586	3,706

Thermlo-F is adapted to the manufacture of many classes of higher quality rubber articles other than inner tubes, such for example as hot water bottles, ice bags, bathing caps, druggists' sundries, pure gum goods, etc.

INTERNATIONAL CONGRESS FOR TESTING MATERIALS

The International Congress for Testing Materials will be held at Amsterdam, Holland, September 12 to 17. The American Society for Testing Materials will participate in this congress where its members will present 18 papers. Among these will be one on a rubber topic, namely "The Abrasion Test as a Criterion of the Toughness of Rubber Compounds," by F. G. Breyer, consulting engineer, Singmaster and Breyer, and H. A. Depew, Research Division, New Jersey Zinc Co.

STRONTIUM SULPHATE

Finely ground strontium sulphate of British manufacture has become available to the rubber industry. It is similar in general respects to ground barytes, except that it can be finer and more easily ground. It occurs abundantly in nature as celestile and is found in its purest form in Gloucester County, England. It is only since last March that the producers have been able to offer a product which satisfies the demands of the rubber industry as to fineness and uniformity of grinding. Its substitution for barium sulphate is largely dependent on the economic conditions of supply, price and volume cost.

DURING JUNE DOMESTIC EXPORTS OF TIRE FABRICS FROM THE United States totaled 390,635 square yards with a value of $133,283. Australia was the leading purchaser with 186,630 square yards, value $68,970; Canada taking 177,916 square yards, value $53,296; and Sweden, 19,791 square yards, value $6,944.

Process Steam

Analysis of Steam Pressures in Industries Reveals Intermediate Pressure Field With Special Problems and Apparatus

MORRIS A. HALL, M. E.

IT may come as a surprise to many engineers, manufacturers and others contacting with users of steam in some form, that a distinctly intermediate pressure field of use exists which calls for different technique, knowledge, equipment, and methods. Probably the earliest use of steam was in the steam engine, to produce power. Steam power producing units have grown and expanded from the first low-pressure engines. Pressures have increased rapidly until today, the words "high pressure" refer to pressures above 250 pounds rather than below it. In this high-pressure field, methods for generation, distribution and use of steam are highly perfected. There are engineers who specialize in this field alone and manufacturers who produce equipment or apparatus solely for high-pressure use.

The second great use for steam was that of heating. The development of this field, however, took a wholly opposite trend as regards pressure. Steam at moderate pressure was used in the beginning and the tendency downward has constantly increased. Engineering and manufacturing efforts have been directed toward effective heating with lower and lower pressures and have been successful. The development of the vacuum system of steam heating, now almost universal, has brought with it wide engineering knowledge of methods for the generation and distribution of steam at so-called "vapor pressures." It is now common practice to heat large structures with only ounces of pressure. Therefore, when one speaks of "low pressure steam" the phrase rarely refers to pressure above 10 pounds.

Between these, the low pressures extending from 10 pounds downward, and the high pressures extending from 250 pounds upward, a third field has developed rapidly. It is tremendously important and almost as large as either of the others. This intermediate field is distinguished by its own problems, distinctive pressures, and apparatus or equipment designed wholly and exclusively for use of steam at these intermediate pressures. This

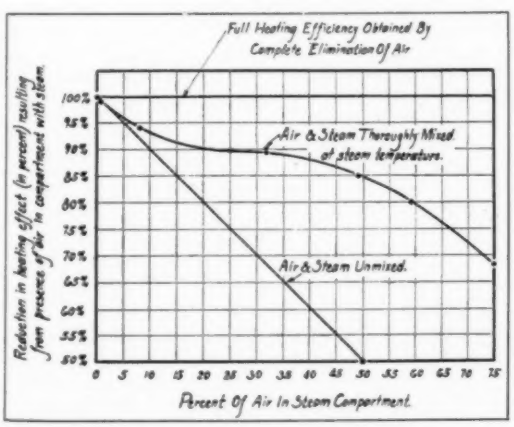


Fig. 1. Effect of Air on Heat Emission from Steam Container

field is the use of steam at pressures betwen 10 and 150 pounds. Steam within this middle range, neither high nor low by present day understanding, is used in various industrial processes and described by the comprehensive term of "process" steam.

In rubber working and the manufacture of rubber goods, steam at process pressures is used in the initial washing of raw rubber, in calenders, driers, vulcanizers, in presses and elsewhere. An examination of methods and equipment for handling steam at process pressures shows that they have lagged behind the standards maintained in heating or low-pressure and power or high-pressure practices.

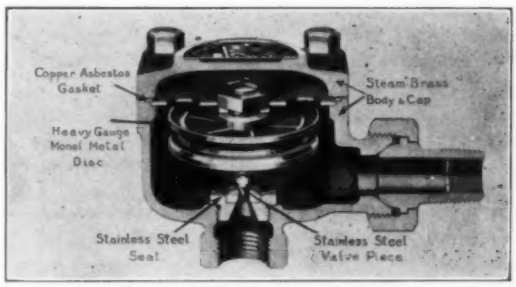


Fig. 2. Webster Thermostatic Steam Trap

In the study of steam utilization it is convenient to divide the subject into three parts, generation, distribution and use. There is no particular problem about process steam generation because high pressure generating plants are suitable, reducing valves providing the desired lower pressures. Similarly, the matter of use presents little difficulty. It is closely allied to the design of the steam-using apparatus in question.

When we turn to process steam distribution or circulation we find a different condition. Users have been left to shift for themselves. They have had to work out their own methods of insuring complete, correct circulation at these intermediate pressures. Manufacturers of machinery using process steam have not always called in steam specialists to work out their problems.

Heating engineers have long known that efficient steam distribution depends upon positive removal from apparatus and pipe lines of air and water of condensation, and preventing escape of steam or water containing unused heat. The importance of free and continuous discharge of air from the interior of the apparatus has not been fully appreciated. In other words, air removal is the crux of the problem of process steam distribution.

Air is present in two forms. It leaks into and fills the steam compartments when the machine is cold. The second form is in mixture with the steam, carried over from the source of supply. This air must be completely discharged before the apparatus can function at full efficiency. Obviously, the more quickly this discharge can be accomplished the sooner the apparatus will reach its maximum output.

The presence of air, of course, retards the transmission of heat and its existence either in air bound pockets or in mixture with steam will reduce the output of any heating unit. The result of the presence of air is shown by the chart, Figure 1.

The second problem in obtaining free and economical circulation is the complete discharge of water of condensation. Various bucket and float types of traps when properly applied will handle large volumes of condensation, although they are ineffective in removing the air.

The complete and continuous discharge of air coincident with the removal of condensation is accomplished by the apparatus pictured in Figure 2. This is a thermostatic trap the body of

which is made of steam brass. The cover is fastened to the body by monel metal tap bolts while a special copper asbestos gasket fitting into a recess insures a tight joint. The expansion member is of monel metal, heavily ribbed. It is held securely in position in the trap body by means of a heavy gage brass plate to which it is bolted and which rests in a recess turned in the body. A distance nut keeps the upper part of the diaphragm far enough away from the plate to permit steam to entirely surround the diaphragm. This construction also allows the parts to be removed for cleaning. The cone shaped valve piece of stainless steel closes against a square edged seat of the same character set into a brass bushing screwed into the outlet of the trap body for easy replacement whenever desired.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
980	Manufacturer of hot water bottle plugs.
981	Hard steel plate to give a highly polished finish to rubber goods.
982	Ear protector with rubber band to go around head.
983	Manufacturers of printers' rubber blankets.
984	Manufacturers of wood rosins.
985	Machine for stripping solid rubber from truck tire rims.
986	Names of manufacturers of toys.
987	Source of supply for crepe soling.
988	Hard rubber grinding machines.
989	Zinc substitute.
990	Manufacturers of gutta percha in thin sheets.
991	Maker of Armortred crepe rubber sole.
992	Machinery for manufacture of rubberized carriage cloth.
993	Machine for imprinting names on fountain pen barrels.
994	Flexible coupling valves.
995	Brass pointed rubber fish scaler.
996	Metal containers for shipping rubber cement.
997	Makers of thin rubber sheeting.
998	Source of supply for powdered charcoal.
999	Makers of tire repair patches.

REINFLATING CHEMICAL FOR PLAY BALLS

Heretofore play balls have been inflated either by direct introduction of compressed air after the ball is molded, or through the medium of a chemical in pill or tablet form which, with a definite quantity of water, is introduced prior to sealing the two halves of the ball together. In the latter case the heat transmitted during the curing or molding of the ball acts on this chemical and produces a gas which inflates the ball to the proper degree and obviates the necessity of a separate inflation with compressed air. In either case there is a limit to the time, usually four or five months, during which the ball will remain inflated. In time, however, there is a gradual loss of pressure resulting in lack of resiliency and the ball loses its usefulness.

Now comes the announcement of the discovery of a chemical which reinflates the ball after a certain definite amount of time has elapsed. The name of this chemical as well as the means of its discovery and development are, for the present at least, being kept secret. This superinflator or reinflator, if such it may be termed, is placed in the ball with the ordinary inflating pill before molding. No immediate effect is produced as this chemical lies inactive for a period of time about equal to the life of the original inflating medium. It then becomes active and forms a gas which reinflates the ball to a point where it is as lively and resilient as when it first came from the mold. This reinflation is said to last for a period of time at least equal to the primary inflation, thus doubling the life of the ball.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circular
1571	Tire Exporters' Weekly News Letter.
1572	Rubber Invoiced to the United States During the Week Ended July 16, 1927.
1573	Crude Rubber News Letter.
1574	Mechanical Rubber Goods Exporters' Weekly News Letter.
1575	Rubber Invoiced to the United States During the Week Ended July 23, 1927.
1576	Tire Exporters' Weekly News Letter.
1577	Crude Rubber News Letter.
1578	Crude Rubber Reexports From the United States; Month of June, 1927.
1579	Crude Rubber Reexports From the United States; Six Months Ended June, 1927.
1580	Imports of Hard Rubber Combs Into the United States During the First Half of 1927.
1581	Imports of Other Manufactures of Hard Rubber Into the United States During the First Half of 1927.
1582	Imports of Belting for Machinery of Cotton and Other Vegetable Fiber and Rubber Into the United States During the First Half of 1927.
1583	Imports of Druggists' Rubber Sundries Into the United States During the First Half of 1927.
1584	June Imports of Golf Balls Into the United States.
1585	June Imports of Rubber Tires Into the United States.
1586	Canadian Exports of Rubber Footwear During the First Half of 1927.
1587	Tire Exporters' Weekly News Letter.
1588	Canadian Tire Exports During June, 1927.
1589	Rubber Invoiced to the United States During the Week Ended June 30, 1927.
1590	Rubber Sundries and Specialties News Letter.
1591	Canadian Tire Exports Heavy During the First Half of 1927.
1592	Crude Rubber News Letter.
1593	Canadian Exports of Rubber Belting and Hose Decrease During the First Half of 1927.
1594	Tire Exporters' Weekly News Letter.
1595	Rubber Footwear Exporters' Monthly News Letter.
1596	French Tire Exports During the First Half of 1927.
1597	French Rubber Footwear Exports During First Half of 1927.
1598	Rubber Invoiced to the United States During the Week Ended August 6, 1927.
1599	Crude Rubber News Letter.
1600	British Exports of Automobile Casings During June and the First Half of 1927.
1601	British Exports of Rubber Footwear During June and the First Half of 1927.
1602	Preliminary Statistics of United States Crude Rubber Imports, July, 1927.
1603	Tire Exporters' Weekly News Letter.
1604	Comparative Tire Exports From the United States, Canada, United Kingdom and France During the First Six Months of 1927.
1605	Comparative Exports of Rubber Boots and Shoes From United States, Canada and United Kingdom During the First Half of 1927.
1606	German Tire Exports During the First Six Months of 1927.
1607	Rubber Invoiced to the United States During the Week Ended August 13, 1927.
1608	Crude Rubber News Letter.
1609	Belgian Tire Exports During the First Half of 1927.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Country and Commodity	Purchase or Agency
26,481	Italy. Rubberized fabrics	Purchase and Agency
26,483	Egypt. Motorcycle tires	Agency
26,490	Czechoslovakia. Rubber toys and balloons	Agency
26,497	Colombia. Rubber sundries and novelties	Sole Agency
26,551	Spain. Automobile tires	Purchase and Agency
26,552	Turkey. Automobile tires	Purchase
26,553	Belgium. Waterproof cloth for automobiles	Purchase
26,554	Denmark. Hose, steam and water, flange packing and allied technical rubber products.	Agency
26,555	Canada. Rubber belting	Agency
26,556	Switzerland. Automobile tires	Agency
26,557	Germany. Rubber novelties	Agency
26,558	Poland. Tires and tubes, and solid tires for trucks	Agency
26,559	Iraq. Boots	Purchase and Agency
26,561	Ceylon. Druggists' rubber sundries	Agency
26,571	China. Bicycle tires	Purchase
26,587	Czechoslovakia. Bicycle tires	Agency
26,600	Egypt. Automobile tires	Agency
26,619	Germany. Surgical and hospital rubber goods supplies	Purchase
26,620	Germany. Waste and raw rubber	Purchase
26,621	Germany. Waste rubber	Purchase
26,647	South Africa. Stamp making rubber	Purchase
26,689	Canada. Composition and crude rubber	Purchase
26,749	Egypt. Men's belts	Purchase and Agency
26,759	Egypt. Rubber balls	Agency
26,767	Denmark. Boots and shoes	Agency
26,803	Sweden. Rubber balloons	Purchase and Agency
26,813	Egypt. Druggists' rubber sundries	Agency
26,836	Italy. Tires, automobile (casings), metric clinchers and straight sides and tubes	Purchase
26,837	Austria. Bathing hoods and shoes, rubber shoes, sundries and toy balloons	Agency
26,851	Brazil. Automobile tires and tubes	Purchase and Agency
26,872	Denmark. Footwear, canvas rubber soled shoes, balls, druggists' sundries, garden hose and sport goods	Agency
26,878	Colombia. Rubber soled canvas shoes	Agency

The Aging Properties of Rubber Bands in Storage[1]

Finished rubber products are not in a stable condition, but undergo changes when exposed to heat, light and air. The purpose of this investigation was to determine the probable life of rubber bands both in service and in storage under various conditions

C. E. BOONE

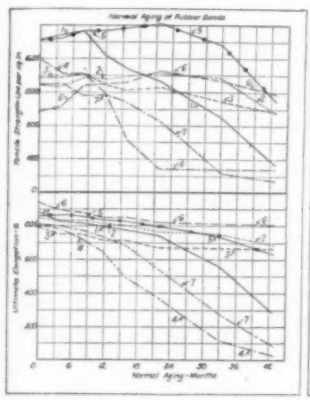


Chart 1

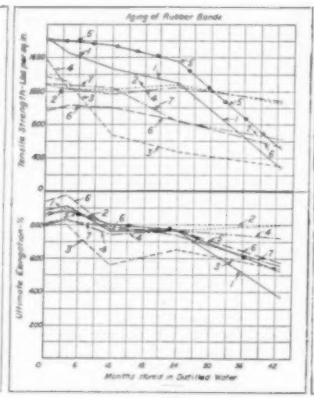


Chart 2

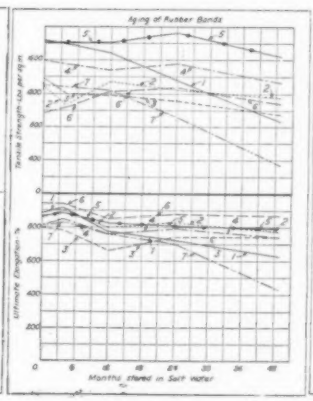


Chart 3

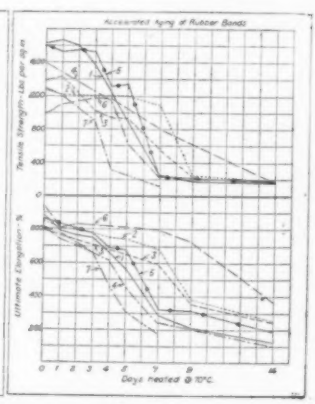


Chart 4

IN January, 1923, newly made rubber bands were obtained from seven manufacturers in order to secure data on the aging properties of rubber compounds of this type under different conditions of storage. The bands were stored in three different ways—(1), normal storage (in the original box); (2), in distilled water; and (3), in salt water. Bands, size No. 30, which are approximately 2 inches long and ⅛-inch in width were selected for the work. The results of the test for strength and elongation over a period of 43 months are given. The most widely applicable tests for determining the quality of rubber compounds are those for tensile strength and elongation. These two tests were made in connection with this investigation and in addition one for tension endurance. This consisted of stretching the bands a definite amount and holding them in this position until breaks occurred. In service rubber bands are often subjected to such a condition.

A study of the aging properties of rubber products naturally involves the making of accelerated aging tests of which there are several. The Geer test, which was used in this investigation, is one that is widely used and consists in subjecting the rubber material to a temperature of 70 degrees C. in air and determining the tensile properties at various intervals of time. It has often been stated that one day at this temperature approximates six months of natural storage.

The composition of the bands used in this investigation was not known. The following, however, represents the usual range of composition of rubber bands from many analyses:

	Percentages by Weight
Rubber	87 to 94
Sulphur	4 to 6
Zinc oxide	1 to 7
Accelerator	0 to 1

At the conclusion of the investigation, determinations of the combined sulphur content were made on bands which had been in air storage. The results are shown in Table 1. For convenience in interpretation the results are given in order of decreasing percentages of sulphur.

TABLE 1

Band No.	4	7	1	5	2	3	6
Combined sulphur, per cent.	3.83	3.80	3.23	2.88	2.58	2.31	1.73

The existing Federal Specification for Rubber Bands, No. 64a, requires a minimum tensile strength of 1,200 pounds per square inch and a minimum ultimate elongation of 800 per cent. The tensile strength and ultimate elongation of the bands after being subjected to an accelerated aging test of 96 hours in dry air at 70 degrees C., shall be not less than 60 per cent of the strength and elongation as determined before heating.

Bands were broken using double spool-type grips. The spools were free to revolve so as to equalize the tension around the band. For each point on the curves from 10 to 20 bands were broken and an average figure computed on the basis of the mean original cross sectional area and length of that particular make of band.

The bands were kept in the original packages, shielded from light and at ordinary room temperatures varying from 21 degrees C. to 32 degrees C. They were tested at intervals of time up to 43 months from the date of the beginning of the test. These results are shown in Chart 1. The type of joint and nature or position of the breaks were as follows:

TABLE 2

Band No.	Type of Joint	Break
1	Lap	Majority at end
2	Butt	End
3	Lap	50% end—50% joint
4	Butt	About evenly divided between joint and end with a few at the side
5	Extruded stock (no joint)	End
6	Butt	50% end—50% joint
7	Butt	Majority at end

[1]Published by permission of the Director of the National Bureau of Standards of the United States Department of Commerce, Washington, D. C.

The joints of the bands were on the side when they were placed on the spool grips. By the ends of a band are meant the two points of curvature.

Bands were stored in distilled water and in a 5 per cent salt water solution at room temperatures (21 degrees C. to 32 degrees C.).

The bands were stored in 500 cubic centimeter bottles about three-fourths full, each bottle containing approximately 125 bands. The water was not changed during the period of storage.

Storage under water was suggested by the common observation that rubber seems to be better preserved when kept under water than when kept in air. Rubber articles found on the battleship Maine when it was raised after 15 years' submergence, were in relatively good condition. The rubber insulation of the Alaskan submarine cable met specification tests for tensile properties when it was taken up after 20 years of service.

The rubber bands were removed from the water at intervals and tested after allowing the surface water to evaporate. The results of these tests are indicated in Charts 2 and 3.

In some cases the bands had swelled due to absorption of water in which event they were tested in the swollen condition, but the results were computed on the original dimensions. Comparative tests of bands which were allowed to dry in the air for several days before testing and those which were tested immediately after the surface moisture had evaporated showed that there was no great difference in the physical properties, if anything the bands which were dried were slightly improved.

There were noticeable increases in volume after storage under water, particularly distilled water. The color of the bands also changed, in some cases. The changes both in air and water storage are tabulated in Table 3.

TABLE 3

	Condition after 43 months' storage		
Band No.	In air	In distilled water	In salt water
1	No change in appearance	Much lighter in color. Swelled 50% in volume	Slightly lighter in color. No appreciable swelling
2	No change in appearance	Much lighter in color. Swelled 25% in volume	Slightly lighter in color. Swelled 16% in volume
3	No change in appearance	Very much lighter in color. Swelled 100% in volume	Slightly lighter in color. Swelled 6% in volume
4	Hard and brittle	Lighter in color. Swelled 25% in volume	Slightly lighter in color. No appreciable swelling
5	No change in appearance	Much lighter. Swelled 33% in volume	No change in color. No appreciable swelling
6	No change in appearance	Very much lighter in color. Swelled 33% in volume	No change in color
7	Somewhat harder	Much lighter in color. Swelled 30% in volume	Slightly lighter in color. No appreciable swelling

Bands were placed in an oven at a temperature of 70 degrees C. for periods of 1, 2, 3, 4, 5, 7, 9 and 14 days respectively and the tests made 24 hours after removal from the oven. These results are shown in Chart 4.

The bands, 10 in number of each make, were stretched on two cylindrical steel rods, ½-inch in diameter, 12 inches apart and left so, protected from direct light and at room temperatures (21 degrees C. to 32 degrees C.). The results obtained in this test are given in Table 4.

TABLE 4

Band No.	Time of break	Position of break
1	3 within an hour	At joint
	7 from 8 months to 3 years	Two at side, 5 at end
2	10 between 1½ years and 43 months	All at end
3	10 between 1½ years and 43 months	All at end
4	10 between 8 days and 4 months	All at end
5	10 between 1½ and 3 years	All at end
6	None broken after 43 months	
7	10 between 1½ and 3½ years	All at end

Band No. 1. The bands deteriorated at approximately the same rate when stored in air and in distilled water. When stored in salt water the deterioration was somewhat less rapid and the bands were in better condition at the end of 43 months.

Band No. 2. Deterioration was slight and occurred at about the same rate under the three conditions of storage.

Band No. 3. The bands aged at approximately the same rate in air and salt water. Those in distilled water were considerably poorer at all stages.

Band No. 4. These bands were much better preserved when stored in either distilled or salt water. The band hardened when stored in air.

Band No. 5. Storage in air and salt water gave the same results up to two years. After that salt water had a preserving action. The bands stored in distilled water deteriorated more rapidly than those stored in air or in salt water, particularly after two years' time.

Band No. 6. About the same as No. 3, except the deterioration in distilled water was not quite so rapid. No. 6 band appears to be undercured as indicated by its initial low tensile strength, and the decided increase in tensile strength after 22 months normal aging and by the accelerated aging test after 4 days. This probably accounts for its performance in the tension endurance test. By undercure is meant the bands had not been vulcanized a period of time sufficient for them to reach a maximum tensile strength. Bands which are slightly undercured usually age better than those which are cured up to the maximum tensile strength. If undercured excessively the initial tensile strength will be low and they will not maintain the tension when stretched.

Band No. 7. There was very little difference in the results obtained after storage under the three conditions. If anything the advantage lies with either distilled or salt water storage, storage in distilled water giving the best results. These bands hardened somewhat in air.

It was observed that approximately 75 per cent of the breaks occurred at points other than the joints.

In no case were the poorest results obtained after storage in salt water and at least three makes of bands gave better results under this condition. Three makes of bands gave poorer results when stored in distilled water than in air or salt water. In general the advantages seem to lie with salt water storage. The matter of swelling, while not affecting the tensile properties deleteriously, might have to be given consideration.

After 43 months normal storage four of the seven makes of bands are still usable.

An inspection of the charts shows that the bands stored under water do not undergo such a decrease in ultimate elongation as those stored naturally.

Conclusions

1. The type of joint in a rubber band has no influence on the position of failure. The majority of breaks occur at points other than the joints.

2. The Geer test is indication of the deterioration that occurs during normal storage.

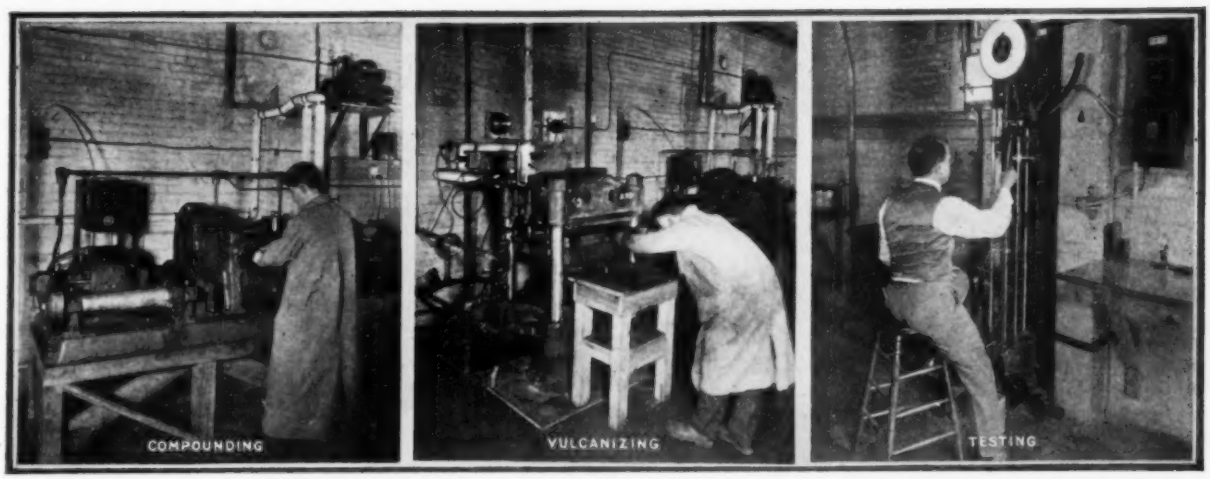
3. Storage in salt water has a distinct preservative effect on rubber bands, but storage in distilled water is of doubtful advantage.

4. Bands of different composition do not undergo the same relative deterioration in air and in water.

5. It is reasonable to expect rubber bands to meet the minimum requirements of the Federal Specifications Board after two years of normal storage. Bands may still be usable after three and one half years of storage.

WASTE BARGAINS SCARCER NOW

At one time some rubber manufacturers held that certain goods could not be made well unless most of the resins had been extracted from the crude stock; but now the value of resin-content is better appreciated. This recalls the story of a typical farmer, who, wandering into a rubber mill yard in Akron, saw a big pile of resinous material that had been expensively removed from raw rubber and offered to take away the refuse for $1 a ton to make roofing stuff. The mill owner, glad to get rid of it, promptly sold the waste. When later he learned that the "farmer," an expert technician, had resold the material to a chewing gum maker at a huge profit, he hired a rubber chemist and soon found a way to utilize the resinous refuse to good advantage.



Rubber Testing Laboratory of Godfrey L. Cabot, Inc., Boston, Massachusetts

Carbon Black Rubber Research Laboratory

C. R. JOHNSON,
Technical Director, Godfrey L. Cabot, Inc., Boston, Massachusetts

THE importance of the rubber industry to the carbon black manufacturer is revealed by the figures of the Bureau of Mines published in April, 1927, in which it is shown that of a total consumption of 175,631,000 pounds in 1925, 86,329,000 pounds went to the domestic rubber trade and of the 43,000,000 pounds shipped abroad it is estimated that 22,000,000 pounds also went into rubber, so that fully 62 per cent of the world's consumption of carbon black is used by the rubber industry. The next largest use in domestic trade is for printing ink, in which 22,000,000 pounds or 12.5 per cent is consumed annually. The reason for this condition is found in the outstanding practical value of carbon black in reinforcing the tensile properties and abrasive wearing quality of rubber.

The importance of the technical questions connected with compound development has given rise in many instances to the establishment of special laboratories by chemical manufacturers and producers of compounding ingredients. These laboratories are most effectively assisting in the development of the industry by cooperating with rubber plant laboratories in the solution of their technical problems.

One of the most recently established auxiliary rubber laboratories, if they may be so termed, is one devoted to the study of carbon black production and use. This has been established by Godfrey L. Cabot, Inc., Boston, Massachusetts, and has been fitted with the usual facilities found in a rubber laboratory. The equipment is modern in every respect and is designed to give close control in accordance with approved standards of testing and experimentation. The vulcanizing equipment is provided with the best obtainable temperature control devices and results correspond with those obtained in well regulated laboratories in the rubber industry.

The services which such a rubber laboratory can render to both the rubber and carbon black industries can be better appreciated after a brief examination of the outlines of carbon black manufacture and use. This material was first used in printing ink and as a pigment for paints and varnishes. For these purposes, color and particularly color uniformity were of great importance. Quite naturally the trend of the industry in design of plant and process was to fit the requirements of this trade, with the result that many grades of black, differing in color and exhibiting varying properties toward ink vehicles, were produced. Indeed, it is a decidedly enlightening experience to anyone who for the first time examines blacks which have been rubbed in oil and compares the great range of blackness in the samples. Because of the exacting requirements of the ink trade, there is a tendency for producers to establish brands to suit certain buyers and to supply each branch from a separate and distinct producing unit. By such a course the manufacturer has been able to achieve uniformity in each brand but perhaps has found it necessary to carry more brands. The point to be emphasized is that the manufacture of carbon black before its extensive use in rubber was largely governed by color consideration and behavior toward ink and varnish vehicles.

Carbon black is made by burning natural gas and allowing the flame to impinge upon a metal surface on which the black is deposited. The variations in color and ink making properties are dependent somewhat on the nature of the gas but more especially on the type of burner tip, channel or plate distance and the manner of combustion. As a rule higher intensity of black is obtained at a considerable sacrifice of yield which is reflected in the price of high grade ink blacks.

The extensive use of carbon black in rubber has led the manufacturer to develop the production of a suitable black of extreme intensity without sacrifice of yield. It is a fact that the so-called better blacks needed for the ink and varnish trade do not give as good results in rubber as the less intense blacks. This is a fortunate circumstance because it is doubtful if enough gas would be available for producing the more intense blacks if they were desired by the rubber trade, and the price would be against their wide use.

Experience in testing the properties of carbon blacks from many sources clearly indicates that *color* can not be taken as a

criterion in judging the usefulness of a black in rubber. It is found that blacks from different sources vary over a considerable range in color and yet show very similar properties when compounded into rubber. Thus it is evident that the utility of a carbon black in rubber can be properly determined only by a rubber test and this fact provides sufficient reason for the establishment of a rubber laboratory by any concern which seeks seriously to serve the rubber trade.

In considering the ways in which a carbon black laboratory can be of service to both industries, attention should be directed toward proper classification of carbon blacks for use in rubber and to clear-cut research in close cooperation with producing units so that the effect of manufacturing variables may be determined and means devised for control of process to assure uniformity and standardization of product. The possession of a rubber laboratory by a carbon black producer makes possible more intelligent progress in plant design and process improvement, particularly in efforts to find ways to improve yield, which is still extremely low when the carbon content of the gas is considered. A rubber laboratory also affords the manufacturer a means to check the value of new methods of condensation of the black in packing containers.

Proximate analyses of carbon blacks from various sources show that they are not pure carbon, but contain, in addition to approximately 2 per cent of moisture, volatile matter ranging from 5 to 12 per cent and fixed carbon from 80 to 92 per cent. Ultimate analysis resolves the constituents other than carbon into hydrogen .5 to 1 per cent and oxygen 5 to 14 per cent. What form these other elements take in combination, physical or chemical, is not clearly known, but it is assumed that occlusion of hydrocarbons and possibly elemental gases occurs.

There remains the very large field of effort in cooperation with users of carbon black in the rubber industry, whereby it should be possible for the laboratory to assist in the better utilization of carbon black in rubber and give aid in connection with technical problems arising in each rubber plant. In recent years there has been exhibited a gratifying and increasing willingness on the part of technical staffs in the rubber industry to discuss problems and cooperate with outside agencies, which is resulting in mutual technical and industrial progress.

ALUM AS A COAGULANT

The prohibition of alum as a latex coagulant applies only to the Federated Malay States and is not in force in the Straits Settlements, nor is its use prohibited or discouraged in the Netherlands East Indies. It is well known that almost any acid reacting substance will coagulate Hevea latex, but that strongly acid substances such as mineral acids are objectionable as they have the effect of reducing the rate of vulcanization of the finished rubber. On the other hand, most of them, except for this, have no deleterious action on the rubber. Alum is one of these substances. It has less effect in retarding vulcanization than sulphuric acid from which it is derived. Although sulphuric acid has been used in considerable quantity for the coagulation of latex there is no prohibition of its use in the Federated Malay States.

Alum is preferred by the native user as being a non-corrosive solid which is readily dissolved in water and is an excellent coagulant. According to Dr. de Vries, the retarding effect of alum is, in some respects, advantageous as it counteracts the exceptional rapid curing properties of slab rubber in which form the native rubber is usually prepared in the Netherland East Indies.

Dr. de Vries, Director of the Rubber Testing Station, Buitenzorg, Java, is reported as supporting the use of alum for "slab" for the following reasons: (1) the use of alum counteracts the rapid cure of "slab" rubber and renders the rate of cure very similar to that of sheet coagulated with acetic acid; (2) its use enables such rubber to be identified by determining the alum left in the blanket crepe; and (3) such rubber is generally not used in first class rubber articles. It is believed that most of this reconditioned rubber is sold to American rubber manufacturers.

Program Rubber Division American Chemical Society

Detroit Meeting

The following interesting program has been announced for the sessions of the Rubber Division of the American Chemical Society at the Detroit meeting, September 6 to 10, 1927.

A symposium on reclaim will occupy the morning and afternoon sessions on Wednesday, September 7, and will include the following papers:

"Pigment Reinforcement of Reclaimed Rubber," H. A. Winkelmann and E. G. Croakman.

"Effect of High Sulphur versus Low Sulphur in Vulcanizing Reclaim," R. E. Cartlidge and H. L. Snyder.

"The Value of the Rubber Hydrocarbon in Reclaim," W. W. Vogt.

"Rate of Cure of Reclaimed Rubber," N. A. Shepard, H. F. Palmer and G. W. Miller.

"Factors in Processing Reclaimed Rubber," P. S. Shoaff.

Following the symposium a paper will be read on: "Effects of Certain Metallic Salts on the Aging of a Tread Compound," Bert S. Taylor and W. N. Jones.

On Thursday morning following the business meeting the following papers will be read:

"An Analysis of a Typical Angle Abrasion Machine," W. W. Vogt.

"Effect of Amphoteric Metallic Salts on Rubber," H. A. Winkelmann and W. N. Jones.

"Influence of Sulphur Rubber Ratio on the Physical Properties of Hard Rubber," D. E. Pearsall.

"Hardness Tester for Rubber," E. C. Zimmerman and R. W. Brown.

At the division dinner, scheduled for members and lady guests on Thursday evening at the Book-Cadillac Hotel, the speaker will be Dr. Karl Arnstein, vice president of the Goodyear Zeppelin Corp., who will tell of the developments, present status, and probable future of lighter-than-air craft.

Friday morning will be devoted to the following program of papers:

"Effect of Ozonized Oxygen on Stretched Rubber," F. L. Haushalter and W. N. Jones.

"Aging of Stretched Rubber," Arthur Kelly, Bert S. Taylor and W. N. Jones.

"An Analysis of Natural and Artificial Aging of Rubber." W. W. Vogt, L. B. Sebrell and S. M. Martin, Jr.

"Effect of Heat on Rubber," C. R. Park, L. B. Sebrell and C. M. Carson.

"The Contribution of Rubber Chemistry to Automotive Transportation," by Dr. W. C. Geer, will be read at the Wednesday morning session of the Division of Industrial and Engineering Chemistry.

In the business session, complete discussion is planned on the proposals which have been circulated among the membership of the division. This includes the establishment of two or three local sections of the Rubber Division which will be entitled to have associate members, taken from those interested in the rubber industry —who are, however, non-chemists.

It is also proposed to circulate among the members of the division a supplementary binding of reprints containing all articles on rubber which are ordinarily printed in the rubber journals and also possibly a few which the journals do not care to print or do not find space for, although this is more of a theoretical possibility than a probability.

SWEDEN'S IMPORTS FROM THE UNITED STATES OF RUBBER PACKING have shown a constant increase in recent years, according to the Department of Commerce. The figures are: (1924) 4,942 pounds, value $3,924; (1925) 9,844 pounds, value $5,353; (1926) 11,356 pounds, value $6,540.

What the Rubber Chemists Are Doing

Vulcanization of Rubber by Sulphur[1]

F. Boiry

In completing his treatise on the vulcanization of rubber by sulphur, the author reaches the following conclusions: I. Vulcanization is the result of three phenomena: (*a*) the chemical combination of sulphur and rubber with the formation of addition compounds; (*b*) polymerization or aggregation of these compounds; (*c*) depolymerization of the rubber under external influences.

The first two essentially constitute vulcanization. The depolymerization of the product which always occurs in connection with vulcanization by sulphur appears to be only parasitic and not at all indispensable to the production of the two others. This depolymerization is manifest in both hot and cold vulcanization in the presence of an accelerator. In the last instance it is less accentuated and to its partial absence is due the superior mechanical properties of rubber vulcanized in the presence of ultra-accelerators.

II. To the phenomenon of aggregation or polymerization is due the characteristic properties of vulcanized rubber: insolubility, elasticity, rigidity, etc. But this phenomenon is produced only when the chemical combination of sulphur and rubber has already taken place.

III. In vulcanization of rubber in the solid state, the three phenomena occur simultaneously. In vulcanization in solution polymerization does not occur, or is at most partial. It is complete only on the removal of the solvent. It is to be noted also that in hard vulcanized rubber polymerization is not complete. It continues after vulcanization. The phenomenon of aging is due in part to the continuation of aggregation.

IV. The phenomenon of aggregation is not produced between the constituents of different chemical compounds. For example, between the molecules of rubber more or less sulphurized and those of crude rubber, but between products having the same percentage composition or of compositions very similar.

V. Probably the phenomenon begins when an atom of sulphur has been introduced into a molecule of rubber. That is to say a compound corresponding to the formula $(C_5H_8)n$ S. Vulcanization of this compound, and generally of rubbers with a small rubber content, does not take place sharply as in the case of rubber that has not been depolymerized by heat or mechanical working.

VI. If the introduction of sulphur into the molecule of rubber is indispensable to the production of aggregation the sulphur is not an agent of condensation uniting by its primary valences the molecules of rubber. Aggregation may be due to adsorption or to the exchanges of secondary valences between atoms of sulphur and molecules of rubber. One is limited to say that vulcanized rubber has a tendency to aggregation greater than unvulcanized. This tendency increases as the content of combined sulphur increases.

VII. Vulcanized rubber may be formed of compositions very similar. Consequently by its increase in weight and the great number of ethylene bonds it contains the molecule of rubber is able to form a number of combinations with sulphur. If all the rubber reacts well with the sulphur during vulcanization it is probable that all the molecules do not react equally, so in certain molecules there may be n double bonds saturated by sulphur, and in others $n-1$ or $n+1$.

These constituents are grouped in complexes of more or less high order. Those of high order and in which predominate the constituents highest in sulphur have the weakest affinity for solvents. Those of lower order, richest in compounds containing less sulphur are soluble and are responsible for the swelling of rubber. The forces which maintain the strong union of the molecules of vulcanized rubber are in part those which exist in the crude rubber and in part those entering with them in production of sulphur in the rubber molecule.

Finally, rubber is probably a two-phase system in which it is possible to separate under certain conditions a liquid and a plastic phase. The last will contain those complexes of high order while those of lower order constitute the more or less plastic liquid phase.

[1] *Le Caoutchouc et la Gutta Percha*, July 15, 1927, p. 13,618.

Aging of Soft Rubber Goods

A comprehensive investigation of the deterioration of typical soft rubber goods by heat, light, oxygen, moisture, degree of vulcanization, etc., has been reported by the Bureau of Standards[1] and summarized as follows:

The results of these tests show that the deterioration of rubber is influenced by internal factors, such as the composition and state of vulcanization, and by external factors, such as heat, light, and oxygen. The effect of the degree of vulcanization is very marked in the case of the pure gum compound. When overcured it deteriorated rapidly regardless of external conditions. This characteristic would not necessarily be true of all compounds which contain a high percentage of rubber. In the compounds containing accelerators the effect of the degree of vulcanization was not so marked.

External factors do not affect all rubber compounds in the same way. One compound may be very sensitive to sunlight while another may be very sensitive to heat. The results obtained by accelerated aging tests do not agree in all cases with those obtained by so-called natural aging. They are most useful as a means of predicting the action of rubber compounds in storage.

Natural aging is usually accepted as the standard of comparison in determining the effect of an accelerated test. Outdoor weather conditions are far from constant at varying periods of the year. It is believed that a better standard might result if the varying factors which are present in an outdoor test were each standardized. Reproducible results might then be possible, and, if desired, one or more of the factors of an outdoor test might be eliminated.

Color influences the rate of deterioration in the presence of sunlight. These tests indicate that, in general, dark colored compounds are more resistant to effects of sunlight than light colored compounds. Many compounds when exposed to sunlight deteriorate by checking or cracking on the surface, this, however, is not true of all compounds. The *D* compounds,[2] which were black, showed very little, if any, checking due to sunlight while the lighter colored ones checked considerably. In the accelerated aging tests, or when stored in the dark, this condition was not apparent.

[1] Technologic Paper No. 342.
[2] Containing gas black, mineral rubber and reclaim.

Chlorinated Rubber in Varnish[1]

Chlorinated rubber is made by reacting on rubber, preferably crude or unvulcanized rubber, with chlorine and it may vary in its combined chlorine content from under 40 per cent to 70 per cent or more depending upon its mode of preparation and the use for which it is intended. All of these varieties are much more readily soluble than the untreated rubber, but the solutions vary greatly in viscosity as well as in other properties. Benzol and its homologs, toluol and xylol, as well as solvent naphtha are good solvents for chlorinated rubber. Other suitable materials are the chlorbenzols, carbon tetrachloride, carbon bisulphide, trichlorethylene and the like.

Solutions of chlorinated rubber in solvents such as those mentioned are suitable for use as varnishes, impregnating composi-

[1] U. S. patent No. 1,635,812.

tions etc., but for many purposes the addition of drying oils, particularly Chinese wood oil, or tung oil is desirable. Such additions improve the "body" of the varnish, as well as the water resistance and flowing qualities.

When wood oil is employed it should preferably be that known to the trade as "prepared wood oil," made by heating the oil near its polymerization point and adding rosin or rosin derivatives, driers, etc., since the untreated oil dries to a frosted or flat finish appearance.

In the manufacture of the ordinary type of varnish, the resin used is, as a rule, first melted or "run" and the hot oil added thereto, after which the varnish is thinned to a suitable consistency. Chlorinated rubber may be considered to be substituted for the resin customarily employed in such compositions, but it has the advantage of being much tougher and harder than most resins. Since it does not melt, but is partially decomposed on strong heating, chlorinated rubber is incorporated by mixing its solution with the oil, either cold or at temperatures not substantially higher than 100 degrees C., the solvent serving to replace a part of the thinner customarily employed.

In certain instances chlorinated rubber solutions may not be completely miscible with wood or tung oil. Both the degree of chlorination of the rubber, and the extent to which the wood oil has been cooked or polymerized influence the compatibility of the two. Thus, solutions of those varieties which are of a lower degree of chlorination are comparatively viscous, and when agitated with wood oil which has been cooked until it is of a thick molasses-like consistency, or with "prepared" wood oil which together with cooking has been treated with rosin to prevent solidification, tend to give turbid or nearly opaque compositions which may separate into two layers upon standing for a time or upon centrifuging. On mixing solutions of chlorinated rubber of low chlorine content with slightly cooked wood oil the turbidity of the solutions is slight or entirely absent and separation is not observed.

Rubber and Rubber Mixings

LOTHAR HOCK

These researches were begun with quantitative determination of the Joule expansion heat in crude rubber using an indirect method by which certain quantities of expanded and non-expanded rubber were allowed to swell in benzol in special colorimeters. Bostroem's measurements show the expansion heat as a linear function of the degree of expansion, while calorimetric effect is not observable below 80 per cent expansion. Similar observations have been made by Hauser and Mark in connection with the intensity of X-ray interferences. The Joule effect is not equivalent to some friction process but is connected with the close packing of molecules, and similar direction of the molecules. The amount of reversible energy expended in expanding rubber cannot be directly determined as the mechanical energy expended in expansion is of a complicated nature.

The calorimetric difference of active fillers alone and when combined with rubber is defined as adhesion heat. Bostroem's tests with micronex and thermatomic carbon made on unvulcanized mixings to determine their respective adhesion are compared with Wiegand's data on increasing resilient energy by addition of fillers. While actually higher concentrations of fillers lead to increased internal friction and resilient energy, the ideal mixing should show increased strength with higher concentrations of fillers.

The experimental determination of expansion heat of rubber and the connection between latent heat and expansion energy is discussed from the standpoint of the principle of thermodynamics.

The experimental determination of the total interfacial surface energy between rubber and its filler seems possible by a calorimetrical process to measure the degree of wetting between rubber and filler particles. By applying thermodynamics to interfacial surface energy between rubber and filler, one can refer the reinforcing action of active fillers to be interfacial surface tension. and the amount of surface wetting.

The possibility of attaining to experimental determination of interfacial surface tension between rubber and filler by way of the ideal, infinitely undiluted mixture, is reported.

For the present the author desires to reserve to himself and his collaborators the further working out of this new field of research.

Ultra-Microscopic Investigations of Rubber Fillers[1]

H. POHLE

In this paper the author discusses the latest method of preparing material preferably by mixing with crude rubber, before measuring its particle size by comparison of absorption of colors with standard samples under the microscope or by the eye. Ultramicroscopic examinations are concluded to be probably only useful for mixings with golden sulphuret of antimony, zinc oxide and lampblack, as with high concentrations and under suitable conditions their powers of reflection should render it possible to obtain microphotographs showing only filler particles.

The luminescence of zinc oxide in the ultra-microscope dark field shows that this phenomenon is phosphorescence. The coarser qualities are more phosphorescent and the very phosphorescent kinds are not suitable for rubber work.

Contrary to the opinions expressed in literature on the subject, dark field observation seems to be peculiarly suited to comparisons of raw materials and for the valuation of individual rubber fillers. But this is subject to the condition that those colloid particles which are physically active in rubber be actually brought under observation. This is only possible when carefully prepared model mixings with rubber itself are used for examination. In these the decisive dispersion effects, as well as the chemical particulars which are not usually conspicuous, are observable. In some fillers it is possible by this means to show that not only poly-disperse colloids are present, but also mixtures which are not chemically uniform. Due to this, the powers of reaction of these substances in rubber are more easily explained.

It is highly desirable that the German colloid producing industry should make use of the microscopic and optical methods which the American competitors have been using for some time.

[1] *Zeitschrift für Wissenschaftliche Microskopie und für Mikroscopische Technik*, 44, 1927, 183-195.

Non-Ox

Non-ox is an anti-ager of British manufacture. It is a neutral and very stable light brown organic compound powder free from inorganic salts, diluents or fillers of low specific gravity. It can be stored indefinitely even in the presence of moisture without its properties being in any way affected. It does not decompose at rubber working temperatures and any slight swell imparted to the rubber mix disappears on curing. For all practical purposes it is non-poisonous.

It can be used for improving the aging and resistance to heat of all rubber compounds, as, for example, in inner tubes, steam hose, packings, tire sidewalls, airbags, etc. In hot air cures it offsets the oxidation which occurs during the vulcanization. In tire treads and mechanical rubber goods subject to abrasive wear Non-ox enables a full cure to be given without fear of rapid perishing in service. It is especially effective in enabling compounds to resist oxidation where large surfaces are exposed to the air.

It prevents "after cure" in accelerated compounds. When used in most accelerated mixes it has little effect upon the cure, and hence can be used in existing compounds without readjustment of conditions. It is equally effective in high and low grade compounds and is especially suited for use with reclaims. It has no initial effect upon the tone of bright colored goods, but as aging proceeds there is a tendency for rubber containing Non-ox to darken slightly, hence it is not recommended for very light colored stocks where color is important.

Chemical Patents

United States

1,634,336. VULCANIZATION PROCESS. This process comprises heating a rubber compound containing sulphur in the presence of the heptaldehyde derivative of an aniline-acreolin reaction product.—C. O. North, assignor to The Rubber Service Laboratories Co., both of Akron, Ohio.

1,634,924. ACCELERATOR. The method of vulcanizing rubber without the addition of sulphur, which comprises subjecting the rubber to vulcanization with an organic polysulphide of the general formula $(-VS)_2S$ as the vulcanizing agent.—G. S. Whitby, Montreal, Quebec, assignor to The Roessler & Hasslacher Chemical Co., New York, N. Y.

1,634,925. ACCELERATOR. A process of treating rubber or similar material which comprises incorporating with the rubber compound a vulcanizing agent and a substituted thiuram polysulphide containing more than four atoms of sulphur per molecule, and vulcanizing.—G. S. Whitby, Montreal, Quebec, assignor to The Roessler & Hasslacher Co., New York, N. Y.

1,635,193. ACCELERATOR. A method of accelerating the vulcanization of rubber that comprises vulcanizing it in the presence of a 1-mercapto dimethyl benzothiazole, or a derivative thereof.—Lorin B. Sebrell, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,635,812. CHLORINATED RUBBER VARNISH. A liquid coating composition comprising a clear stable solution of chlorinated rubber incorporated with boiled drying oil, such oil being boiled at about the maximum degree compatible with the miscibility therewith of the specific chlorinated rubber employed.—Norris Boehmer, Montclair, New Jersey, assignor to Chadeloid Chemical Co., New York, N. Y.

1,637,790. ACCELERATOR. A halogen derivative of a mercapto-thiazole is used as an accelerator of vulcanization.—Jan Teppema, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

Reissue

16,682. VULCANIZING METHOD. The method of producing an article of rubber having one part vulcanized and another part unvulcanized, which consists in mixing two separate stocks, one containing rubber, sulphur and a vulcanization retarder, and the other rubber but no sulphur. These stocks are juxtaposed and subjected to vulcanizing temperatures.—R. M. Warner, assignor to The Miller Rubber Co., both of Akron, Ohio.

Dominion of Canada

272,308. RUBBER UNITING COMPOSITION. A composition for applying to metal, etc., consisting of a vulcanizable rubber solution to which is added about 5 to 10 per cent. of asphaltum. The object when coated being subjected to the action of dry heat.—Robert Morse Witthycombe, New South Wales, Australia.

272,568. ANTI-SKID RUBBER. A rubber surface is rendered anti-skid by first removing the luster from the surface, then applying and drying successive coats of shellac followed by a varnish coat containing ground white lead upon which sand is applied.—Cleophas Brodrique, Quebec City, Quebec.

272,688. VEGETABLE OIL PROCESSING. Heavy vegetable oil, such as castor, is slowly flowed in a thin stream through a passage having walls of non-catalytic material. A relatively high heat is maintained in the passage sufficient to completely decompose the oil and volatilize the decomposition products.—The Dominion Rubber Co., Ltd., Montreal, assignee of Harold Stannard Adams, Kalamazoo, Michigan, and Ludwig Meuser, Bergenfield, New Jersey, both in U. S. A.

272,862. ACCELERATOR. The method of accelerating vulcanization of caoutchouc which comprises vulcanizing it in the presence of an amino-polyhydroxy aryl condensation product.—The Goodyear Tire & Rubber Co., assignee of Lorin B. Sebrell, both of Akron, Ohio, U. S. A.

272,886. RUBBER REGENERATION. A process of regenerating the rubber contained in pneumatic tires comprising impregnating the ground tires with oil produced by the distillation of waste tires and thereafter plunging the impregnated material into hydrochloric acid. After thus destroying the contained fiber the mass is washed with water to remove the acid and fiber.—La Syndicat France Néerlandais, assignee of Charles Danier, both of Paris, France.

United Kingdom

270,374. POROUS RUBBER. A porous rubber or ebonite having only microscopically small pores is used for absorbing and applying liquids. A suitable rubber may be obtained by adding magnesium sulphate solution to a mixture of latex, water and sulphur until a jelly is formed and vulcanizing this under pressure in water or saturated steam. —H. Beckmann, 26 Albertinenstrasse, Zehlendorf, Berlin, Germany.

270,644†. ACCELERATOR. Salts of aliphatic or aromatic amines or of their substitution products or derivatives, are used to accelerate the vulcanization of rubber. Salts of inorganic acids, such as sulphates, chlorides, nitrites, sulphites, thiosulphites are preferable, although salts of organic acids may be used. In an example 100 parts of rubber, 3 parts of sulphur, 6 parts of zinc oxide, and 1 part of diloly-guanidine thiosulphite is vulcanized in 30 minutes at 3 atmospheres pressure.—Silesia Verein Chemischer Fabriken, Ida-und Marienhütte, near Saarau, Germany.

270,658†. PIGMENTS AND FILLERS. Pulverulent pigments and fillers, particularly pigments having a carbon base, are treated so as to coat their particles with a thin covering of rubber. Lampblack, carbon, etc., is incorporated with a small quantity of rubber solution, and the solvent is vaporized. The materials so produced are particularly of value in the caoutchouc industry and may be introduced as fillers into reclaimed or artificial rubber and plastic materials generally.—Compagnie Lorraine de Charbons Lampes, et Appareillages Electrique, 56 Rue du Faubourg St. Honoré, Paris, France.

270,675†. REGENERATING RUBBER. Comminuted scrap rubber is treated with a hot solution of sodium hydroxide which has been in contact with cellulose or the waste lyes produced in the manufacture of viscose, and containing about 4 per cent of sodium hydroxide. The waste rubber is cooked for four hours at a pressure of about 12 atmospheres. The solution may be reused, and may be mixed with untreated solution.—W. Scheithaur, 22 Buchholtzstrasse, Saale, Naumburg, Germany.

271,073. DEVULCANIZING RUBBER. Old rubber is pulverized and heated under pressure with hydrogenated hydrocarbons such as hydronaphthalene whereby sulphur is removed as hydrogen sulphide. A solvent such as benzine or benzol is added and solution obtained by heat and pressure. The naphthalene may be removed by freezing. The mass is vulcanized by heating with sulphur to produce a binder for paints, varnishes, cements, etc.—J. Tengler, Tägerwilen, Kanton Thurgau, Switzerland.

271,076†. FIBROUS COMPOSITION. The waste of cotton or wool manufacture or roved wool or cotton is treated with a zinc salt and an acid, and is then impregnated with rubber solution, compounded, molded and vulcanized.—C. G. A. Lundberg, Tidan, Sweden.

271,174. SEALING AND LINING METAL CANS. A compound for lining and sealing the seams of metal cans is made by emulsifying rubber latex with kaolin or like clay in water. From 1 to 2 parts by weight of clay may be emulsified with 5 parts of rubber latex.—G. F. Blombery, Glenwood, Longueville Road, Lane Cove, near Sydney, Australia.

271,329. JELUTONG. Jelutong latex is coagulated in the known manner and then dried until the product contains less than 5 per cent moisture. The coagulated product may be sheeted or creped before drying.—S. S. Yates, Englewood, New Jersey, U. S. A.

271,553. TREATING VULCANIZED OILS WITH LATEX. Emulsified oils or fats are treated with a vulcanizing agent whereby a gel is obtained and dried after the addition of a coagulant. The emulsified oil may be mixed with rubber or like latex prior to treatment with the vulcanizing and other agents. To the emulsified oil is added a sulphide or polysulphide and after a time a gel forms. The addition of a coagulant such as aluminum sulphate produces quicker drying of the gel.—F. Kaye, The Laurels, Park avenue, Ashton-on-Mersey.

† Not yet accepted.

Germany

446,945 METHOD OF IMPREGNATING FELTS WITH LATEX. Robert Russell, Rhodes and Herbert Broomfield, Stockport, England. Represented by, F. Schwenterley, Berlin S. W. 11.

France

617,003 RUBBER VULCANIZING PROCESSES. E. I. du Pont de Nemours and Co.

617,278 INCORPORATING RUBBER IN LEATHER. E. Knecht.

617,477 RECOVERING VOLATILE SOLVENTS. Metallbank und Metallurgische A. G.

618,834 APPLYING RUBBER TO METALS AND GLASS. R. M. Withycombe.

619,682 PROCESS FOR INCORPORATING SUBSTANCES IN DISPERSIONS, PARTICULARLY LATEX. The Anode Rubber Co., Ltd.

PROTECTING RUBBER AGAINST AGING

A process for the protection of rubber against the effects of oxygen and actinic light has been developed in England by B. D. Porritt and T. R. Dawson, British patent No. 269,745, both of the Research Association of British Rubber & Tire Manufacturers.

Previous processes for the preservation of rubber from oxidation by the oxygen of the air, and the deleterious effects of the actinic rays of light have been based on methods designed to check oxidation and its effects, or by method intended to protect against actinic and ultra-violet light. The present process consists in the application to all classes of goods containing rubber of combinations of small amounts of substances which protect the rubber simultaneously against the effects of oxidation and actinic light.

The substances are those forming the classes of anti-oxidants, including the mono-, di-, and poli-hydric phenolic compounds (as for example, hydroquinone, resorcinol, pyrogallic acid), and including the amino-hydroxy compounds (as para-amino-phenol), which prevent or delay oxidation, or act as negative catalysts of oxidation.

The substances which are used to resist the action of light include bodies able to absorb light rays, especially towards the ultra-violet and of the spectrum, such as dyestuffs of yellow and red shades, or derivatives of coumarin well known as absorbents of ultra-violet.

UNITED STATES EXPORTS TO FINLAND OF RUBBER PACKING HAVE shown a remarkable increase in recent years. Statistics, according to the Department of Commerce, are as follows: (1924) 1,232 pounds, value $776; (1925) 738 pounds, value $363; (1926) 39,368 pounds, value $18,463.

American Rubber Technologists

HENRY FREDERICK SCHIPPEL, elec. engr. *b.* Dec. 17, 1891, Montreal, Quebec, Canada, B.Sc. in elec. engr. McGill U., Montreal, 1912; eng. with Canadian Gen. Elec. Co., Peterborough, Ontario, 1912-14; lecturer, McGill U. in elec. eng. 1914-17; research engr., Canadian Consolidated Rubber Co., Montreal, 1917-19; research engr. Ames-Holden-McCready, Montreal, 1919-20; development engr., Ames-Holden Tire Co., Kitchener, Ontario, 1920-22; tire supt., Ames-Holden Tire Co., 1922-25, tire design and tech. service engr., B. F. Goodrich Co., Akron, O., since 1925. *Author:* "Fabric Stresses in Pneumatic Tires"; "Volume Increase of Compounded Rubber Under Strain." *Member:* S.A.E. *Address:* 816 Work Drive, Akron, O.

Harold William Greider, chem. *b.* Aug. 1, 1894, Manchester, Kan.; B.Sc. Washington Coll., 1916; M.Sc. Kan. U., 1917; inst. in chem., Kan. U., 1916-17; asst. chem., Ordnance Dept., U. S. A., Picatinny Arsenal, 1917-19; industrial fellow, Mellon Inst. of Indus. Research, as follows; Fries & Fries Co., Cincinnati, O., 1919-20; Magnesia Asso. of Amer., 1921-23; Philip Cary 1924-26; asst. tech. ed. *India Rubber Review;* research chem. in charge of development work on heat insulation products and magnesia, Philip Cary Mfg. Co., Plymouth Meeting, Pa., since 1926. Researches as follows: on explosives; synthetic organic perfume; chemicals and solvents; magnesia products; rubber; heat-insulation materials. *Author:* "Analysis of 85 Per Cent Magnesia"; "Rubber Compounding Ingredients"; "Abrasive Resistance of Rubber", and general review articles on rubber research progress. *Member:* Amer. Chem. Soc., Sigma Xi, Alpha Chi Sigma, Tau Delta Pi. *Address:* Germantown Rd., Plymouth Meeting, Pa.

Elvah Harley Grafton, chem. *b.* Apr. 8, 1885, Steubenville, O.; Buchtel Academy, 1908; B.S. 1911, M.S. 1913, Buchtel Coll; Ph. D. U. of Chicago, 1919; instr. in chem. Buchtel Coll. 1911; instr. in chem., U. of Pa.; anal. chem. Goodyear Tire & Rubber Co.; research fellow, phys. chem., organic chem. and physics; research chem. Manhattan Rubber Mfg. Co,; chf. chem., Quaker City Rubber Co., 1920-25; tech. supt. Murray Rubber Co., Trenton, N. J., since 1925. *Author:* "Solvents for Vulcanized Rubber Compounds" Ph. D. thesis, "Surface Energy of Mercury for Organic Liquids," "Technical Data on Organic Accelerators," in R. T. Vanderbilt note book. *Member:* Amer. Chem. Soc.; A. S. T. M. Secretary Com. D-11 Rubber Products; Franklin Inst. R.A.A. Mechanical Goods Specif. Com. vice chairman; App. Amer. Inst. Chem. Engr.; Sigma Xi, Gamma Alpha, Phi Eta, Alpha Sigma Phi, Masonic orders. *Address:* 800 Washington Ave., Palmyra, N. J.

Leon James Dyson Healy, chem. *b.* Jan. 5, 1888, New Britain, Conn.; S.B. M. I. T. 1909; chem. with Boston Woven Hose & Rubber Co., Cambridge, Mass., 1910-11; chem., U. S. Rubber Co., 1911-15; chf. chem. Federal Rubber Co., 1915-1919; tech. mgr., Racine Auto Tire Co., 1919-21; secy. & treas., Wright Rubber Products Co., 1921-23; tech. supt. Fisk Rubber Co., Western Div., Cudahy, Wis., since 1923. *Author:* Inventions on processes, plastics and rubber articles. *Member:* S.A.E.; Amer. Chem. Soc.; Institution of Rubber Industry (England); A. S. T. M. *Address:* 559 Superior street, Milwaukee, Wis.

George H. Ellinwood, chem. *b.* Oct. 21, 1874; B.S. Worcester Polytechnic Inst., Worcester, Mass., 1897; chem Amer. Steel & Wire Co., Worcester, Mass., 1879-1901; chf. chem. Washburn Wire Co., 1901-1903; chf. chem. Boston Woven Hose & Rubber Co., Cambridge, Mass., 1903-1906; chf. chem. B. & R. Rubber Co., North Brookfield, Mass., 1906-1910; chf. chem. Davidson Rubber Co., Boston, Mass., 1910-1912; supt. Cambridge Rubber Co., Cambridge, Mass., 1912-1914; tech supt., Boston Belting Co., Boston, Mass., 1914-1919; tech. supt. Federal Rubber Co., Cudahy, Wis., 1919-1924; tech. director, Boston Belting Co., Boston, Mass., 1924-1926; fact. mgr. American Rubber Mfg. Co., Oakland, Calif., since 1926. *Member:* Amer. Chem. Soc.; A. S. T. M.; S.A.E.; I. O. O. F. *Address:* American Rubber Mfg. Co., Oakland, Calif.

Raymond M. Warner, chem. *b.* June 18, 1893, Barberton, O.; Municipal U. of Akron, 1916; successively analyst, research chem. on factory specifications and as asst. compounder of tires, tubes and repair materials. *Member:* Amer. Chem. Soc.; Lambda Chi Alpha, Masonic organizations. *Address:* 154 Lloyd street, Barberton, O.

Harry M. Flint, chem. *b.* Garden Plain, Kan.; B.S. in chem. eng. U. of Colorado, 1918; development dept. 1918-1923, chf. chem. Gates Rubber Co., Denver, Colo., since 1923. *Member:* Alpha Chi Sigma; Amer. Chem. Soc. *Address:* 124 South Logan street, Denver, Colo.

Stanley Myron Jones, chem engr. *b.* Nov. 27, 1889, Holland Patent, N. Y.; B.S. in chem. engr. U. of Delaware, 1910; B.S. in chem. engr. U. of Pa., 1915; engr. of tests, Kelly Springfield Tire Co., Akron, O., 1917-1921, and same at Cumberland, Md., since 1921. *Member:* Rubber Asso. of Amer.; Cumberland Country Club. *Address:* 17 Frost avenue, Frostburg, Md.

Carl E. Frick, chem. *b.* June 17, 1894, Akron, O.; B.Sc. U. of Akron, 1916; M. A. Ohio State U., 1917; Ph. D., U. of Wis., 1923; gas chem. Amer. U. Exper. station, Washington, D. C., 1918, instructor, Case School of Applied Science, Cleveland, O., 1918-1919; chem. Phila. Rubber Works Co., Akron, O., 1919-1920; instructor, U. of Wis., 1920-1923; chem. Van Cleef Bros., Chicago, Ill., since 1923. *Member:* Amer. Chem. Soc.; Sigma Xi, Phi Lambda Upsilon; High Noon Club of Chicago; Mason. *Address:* 6756 Chappel avenue, Chicago, Ill.

Frederick P. Jecusco, chem. *b.* July 18, 1890, New York City; A. B. 1912, M. A. 1915, Bates Coll; Hamilton Coll. of Law, Chicago, Ill.; research chem., Ansonia O. & C. Co., Ansonia, Conn., 1912; asst. and instructor of indus. chem., Bates Coll., 1913; research chem. Ansonia O. & C. Co., 1914-17; chf. chem. E. O. C., U. S. A., U. S. Explosive plant, Nitro, W. Va., 1918-1919; tech. supervisor rubber thread and elastic webbings, 1919; research dyestuffs and control work of manufacture of rubber thread since 1921. *Author:* Articles "Bleaching Cotton Yarns," "Ultra Violet Light," and "Aging of Rubber." *Member:* Amer. Chem. Soc.; Soc. of Chem. Indus. (English); Odd Fellow; Masonic bodies. *Address:* Box 234, Middletown, Conn.

Herbert A. Endres, chem. *b.* Oct. 14, 1896, Akron, O.; A. B., M. S., Stanford U. 1920; Goodyear fellowship for study of chemistry of rubber, U. of Akron, 1920-21; research chem., Goodyear Tire & Rubber Co., 1922-1924; research chem., The Cellite Co., Lompoc, Calif., since 1924. *Author:* "Relative Activities of Accelerators in the Vulcanization of Rubber," "Limitations of the Obscuring Power Method for Determining the Particle Size of Pigments," "The Crystallization of Sulphur in Rubber and the Phenomenon of Blooming." "Factors Determining the Reinforcing Value of Fillers in Compounded Rubber." *Member:* Phi Lambda Upsilon, Sigma Xi, Kiwanis Club, Masonic bodies. *Address:* Lompoc, Calif.

William L. White, Jr., engr. *b.* 1891, Bloomsburg, Pa.; B.S., Penn. State Coll. 1913; U. S. Rubber Co., 1913-1914; Rubber Regenerating Co., Naugatuck, Conn., 1914-1917; mgr. packing dept. Manhattan Rubber Co., since 1917. *Member:* Alpha Chi Sigma. *Address:* 181 Madison avenue, Clifton, N. J.

Augustus Whiton Vennema, engr. *b.* May 13, 1887, Kalamazoo, Mich.; M. E. Stevens Inst. Tech., 1909; with Manhattan Rubber Mfg. Co., Passaic, N. J., since 1909, asst. supt., 1927. *Member:* Beta Theta Phi. *Address:* 30 Kent Court, Passaic, N. J.

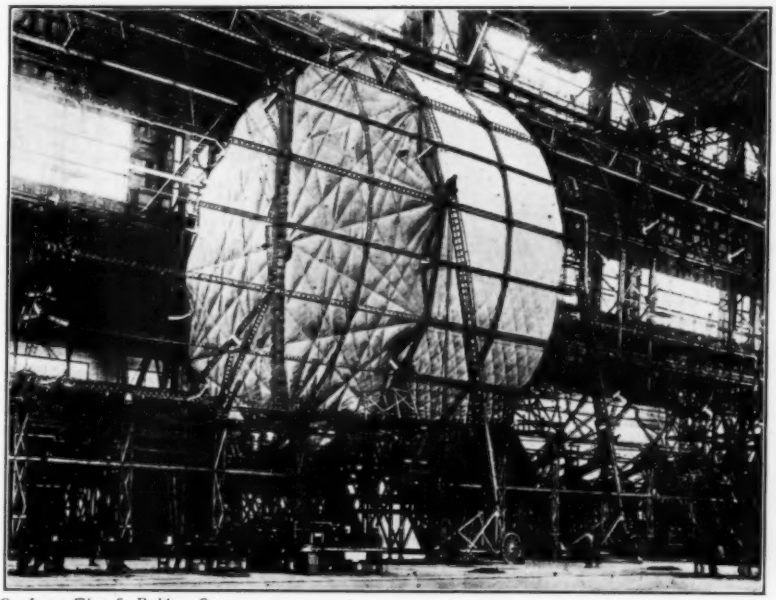
John Vincent Bassett, chem. engr. *b.* Sept. 8, 1893, Norfolk, Va.; A. C., U. of Buffalo, 1915; lab. foreman, Buffalo Copper & Brass Rolling Mill, 1915-1917; asst. chf. chem., Hewitt Rubber Co., Buffalo, N. Y., 1917-1922; specif. chem. Manhatan Rubber Mfg. Co., Passaic, N. J., since 1922. *Author:* Designer of Palo Electric Analysis Apparatus, "The Practical Application of Electro Analysis," "Résumé of the History of Rubber Rings in Bell and Spigot Joints," "The Use of Rubber as a Joining Material in Pipe Lines." *Member:* Amer. Chem. Soc.; Southwestern Public Service Asso. *Address:* 26 Brookfield road, Upper Montclair, N. J.

THE INDIA RUBBER WORLD'S *brief biographies of American rubber technologists are valued by our readers because they record the accomplishments of the men in charge of the research, development and control work of the rubber manufacturing industry.*

Technical superintendents, chemists, process and development engineers in rubber manufacturing and reclaiming plants, research, testing and service laboratories are invited to send their biographical data to us for publication.

New U.S. Airship Gas Fabric

Bureau of Standards Developing Substitute for Costly Goldbeaters' Skin Cell Material



Goodyear Tire & Rubber Co.

Rubberized Gas Cell Completely Inflated and Positioned in a Rigid Airship

A PRESS report that the fourteen gas cells of the United States airship Los Angeles are to be replaced with similar containers made of a wholly different material is not correct, according to a statement made to the INDIA RUBBER WORLD by the United States Bureau of Standards. The latter declares that the gas cells of the Los Angeles, which has been undergoing repairs at Lakehurst, New Jersey, will be of the goldbeaters' skin type and of substantially the same material as has long been used on dirigible balloons of the Zeppelin model.

In the construction of the cells, it is stated by the Bureau, a cotton cloth weighing not over two ounces per square yard and having tensile strength of not less than forty pounds per inch in both warp and filling directions, forms the base fabric. This cloth is coated with 0.5 ounce of rubber and steam-cured just enough to reduce the tackiness to the point where the rubber will not be pulled away from the cloth if two such surfaces become stuck together. The fabric is then assembled into sections, seaming being done with rubber cement, and the rubber cement is applied to the surface as an adhesive for the goldbeaters' skin.

Nature of Goldbeaters' Skin

Goldbeaters' skin is the lining of the caecum or blind gut of the ox and usually it is prepared by washing, treating with camphor or alum, and coating with egg albumen or a substitute. Much of the skin imported from Germany and England comes in 3½-inch square sections, but it may be had up to 6 by 30 inches. Laid on rubberized fabric, it is remarkably resistant to the passage of air or the gases hydrogen and helium. The manufacture of a set of such skin lined cells is a very expensive procedure inasmuch as it requires tedious hand labor throughout. The gas cells of the airship Shenandoah, for example, necessitated the handlaying of half a million goldbeaters' skins. As the supply of such skins is limited and it is probable that the Zeppelin type of airship will continue to be developed, it is evident that another gas cell material must soon be provided.

In Bureau of Standards practice the goldbeaters' skin, after being thoroughly washed and inspected, is immersed in a dilute solution of glycerin in the initial process. The excess water is then squeezed from the skins by hand and, while still wet, the skins are applied by hand to the rubber-surfaced cloth. When dry, the fabric is varnished, and when the varnish is dry it is coated with talc to prevent it sticking to itself or other surfaces.

The weight of such cell fabric, not including seams, must not exceed 4.5 ounces per square yard, and its permeability to helium must not be more than one liter per square meter per 24 hours. The final operation is assembling fabric sections into a complete cell.

Government Fabric Is Promising

Individual experimenters have long been trying to develop a balloon or airship gas cell fabric that would be cheaper and at least as efficient as that of the goldbeaters' skin type, many of them pinning their faith to the use of nitro-cellulose or similar solutions as a coating for the woven cotton base material; and various processes of dipping, spreading, and spraying such solutions, with or without a rubber priming, have been considered, but they do not appear to have yet produced an entirely satisfactory material.

Government investigators, especially those of the United States Bureau of Standards, seem to have been more fortunate; and that body now regards the solution of the problem of making an efficient substitute for goldbeaters' skin fabric as close at hand, following several years of experimenting under grant from the Navy Department. Production of the new fabric has already passed the laboratory stage and samples have been made successfully on a factory scale. Arrangements are being made for practical airship tests of experimental cells of full size made from this new material.

The new fabric is lighter in weight and of lower permeability than goldbeaters' skin fabric. The raw materials are said to be available in unlimited quantities, and as the coating can be applied as a continuous film by a mechanical process the finished product is more uniform than the goldbeaters' skin fabric and can be made at a relatively low cost. It is stated that a complete cell of the new fabric should cost less than one-half as much as a similar cell of goldbeaters' skin fabric.

As manufacturing methods are improved and cheapened, and quantity production becomes warranted, it is expected that the present cost of production can be reduced considerably. Even at the present comparatively high production cost, it is estimated that there can be effected in the manufacture of the gas cells for the two new airships proposed by Congress a saving of about one million dollars, or one-ninth of the total estimated cost of those ships.

New Machines and Appliances

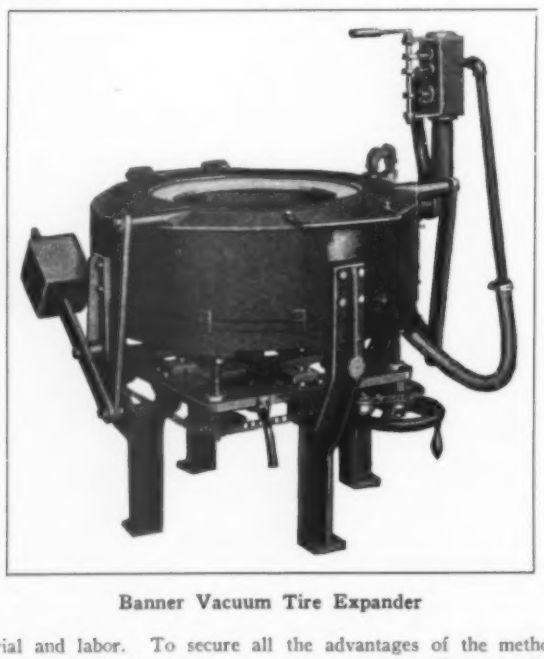
Largest Steel Steam Platen

RUBBER working machinery such as mills, mixers, calenders, presses, etc., has been steadily increasing in size to meet the modern demand for large volume production. Rubber hydraulic presses were made unusually ponderous by being built with cast-iron platens. One of the disadvantages of these presses is the loss of time necessary to heat or cool the heavy platens. Comparatively recently rolled steel platens have been substituted. These have so many advantages over cast plates they have practically superseded them. They are much stronger and lighter, heat and chill faster and their surfaces take a high polish which makes a far better and more accurate product.

The Southwark Foundry & Machine Co., Philadelphia, Pennsylvania, was the first to make large steel platens and has made a specialty of very large size plates such as are used in presses for belting, tiling, matting, etc. This firm has just completed the largest steel platen as shown in the opposite picture. The dimensions of this plate were 36 feet 11½ inches long, 6 feet 2½ inches wide and 4 inches thick. Steam passages were drilled through the solid steel and connected so as to give the most efficient steam circulation. Both surfaces received a highly polished finish. The ingot from which the plate was rolled weighed 54,000 pounds and required 39 passes through the rolls to bring it down to the plate thickness of 4 inches. It was rolled at the Lukens Steel Co., Coatesville, Pennsylvania, in the world's largest plate mill.

Vacuum Tire Expander

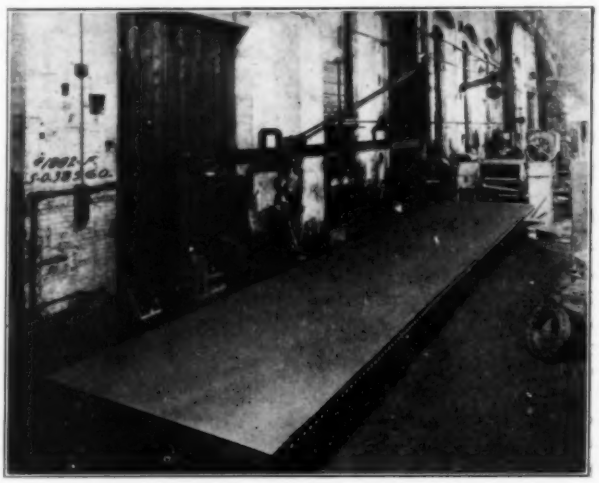
The method of building tires in band form and subsequently shaping them for molding by an expanding mechanism has become a generally accepted method. This process permits accuracy and uniformity of construction as well as substantial saving of material and labor. To secure all the advantages of the method, however, the band structure must be expanded uniformly. This requisite is best fulfilled by employing a vacuum expander as represented in the illustration for shaping the tire bands.



Banner Vacuum Tire Expander

The vacuum expansion process radically differs from mechanical expansion because no resistance is offered to the free expansion of any part of the carcass. The cords are uniformly adjusted in their natural positions each one assuming the location in which it will act to the fullest efficiency. This result cannot be obtained by mechanical apparatus because frictional resistance of the expanding segments destroys the uniformity of structure.

The vacuum expander is also the most rapid means of shaping tires. The inner face of the tire is unobstructed allowing the airbag to be quickly inserted. In other words the shaping and bagging of the tire is one operation. Flat built tires can be shaped and bagged with the vacuum expander at a higher rate of speed than core built tires can be bagged so that the shaping of the tire is of no expense.—The Banner Machine Co., Columbiana, Ohio.



Largest Rolled Steel Press Platen

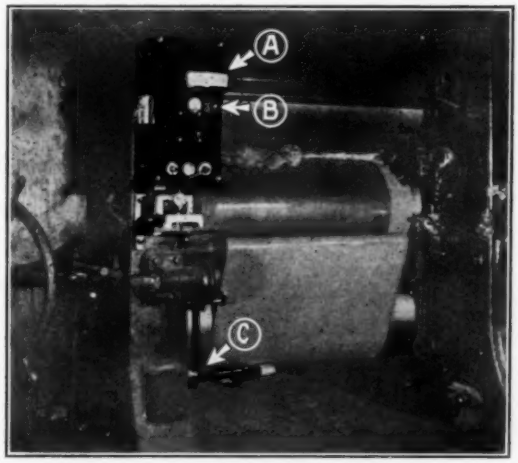
Magnetic Sheet Stock Gage

The problem of gaging sheet rubber accurately and across the sheet as it is being calendered had never been solved until the invention of the magnetic method. The gaging device by which this desirable result is accomplished comprises three units as shown in the illustration. These are: (1) a motor panel upon which is mounted at *A*, a meter of the zero center type reading toward right and left from zero to 15; (2) a setting device *B* with a dial similar to that of the familiar micrometer gages in common use; (3) a magnetic carriage *C*. The latter is a specially designed electro magnet supported between aluminum rollers which rest upon the sheeted material either while it is on the calender roll or passing over an idler pulley or cooling drum.

Mounted and connected on the frame of a calender any movement of the magnet carriage *C* toward or away from the roll, over which the stock to be gaged is passing, is due to a variation of the stock from the set gage and is indicated instantly by the meter reading which shows variations by one tenth or one thousandth of an inch. Thus, since the distance apart of the magnet carriage and the calender roll varies only as the gage of the stock varies, the indications on the meter show actual changes in stock thickness.

To use the gage the operator adjusts the setting device *B* so that the index on the dial points to the thickness required. The rollers of the magnet carriage are allowed to rest against the calender roll,

the stock passing under the rollers. When the calender is started, its rolls are adjusted to the point where the meter hand of *A* rests at zero. Any deflection of the meter hand to right or left of



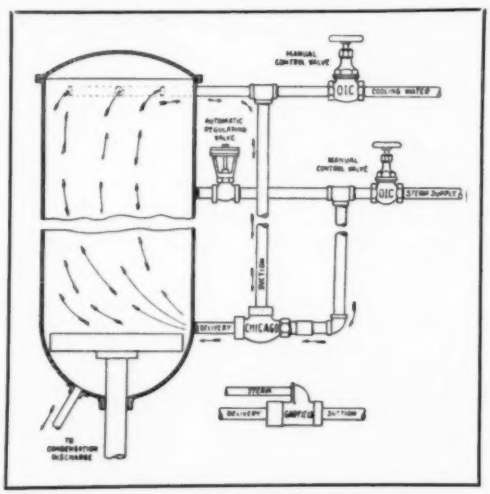
The Schuster Calendered Stock Gage

zero shows in thousandths of an inch the variations of the measure of the stock from the standard gage set.

The instrument is rugged, accurate and dependable. It is connected to a 110-volt lighting circuit and requires but 100 Watts for its operation.—The Magnetic Gauge Co., Inc., Akron, Ohio.

Steam Circulation System for Vulcanizers

A dependable system is very desirable for insuring the circulation of steam and the elimination of air from the common deep form of tire vulcanizer. The arrangement of apparatus illustrated in the diagram shows the application of the ejector system to the solution of this problem. The piping arrangement makes use of a



Ejector Heater Circulation System

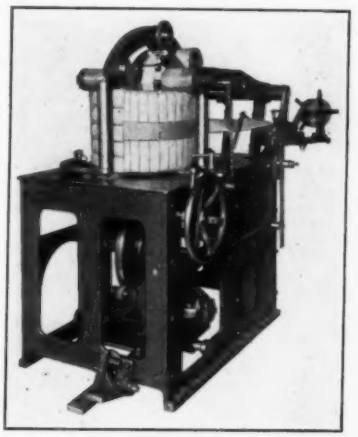
special type ejector, the suction connection of which is piped into some point near the top of the heater. In heater connections where a top cooling water supply pipe is used this connection is piped into the heater at any point near the bottom as indicated in the diagram. The delivery connection is piped into the heater at any point near the bottom. The steam connection is piped into the steam supply line between the manual control and the automatic control valve.

When the heater is in operation the action is as follows: The steam supply to the ejector being always higher than the pressure within the heater, the ejector can discharge into it thus creating a partial vacuum on the suction side. This produces a constant circulation from top to bottom of the kettle thus preventing formation of air pockets at any point in the heater. In the absence of any positive circulation the air trapped in the heater when it is closed may cause an air pocket at any point in the vulcanizer and by its insulating effect cause an under cure at the point.

In connection with the system described two points should be noted: (1) the steam used to create the circulation does not constitute an additional expense since it is discharged directly into the heater and becomes part of the curing steam; (2) the orifice in the steam ejector must be of such size that it will discharge less steam than the minimum required by the heater. If this is not the case, the automatic steam control valve will not function.—The Ohio Injector Co., Wadsworth, Ohio.

Wire Bundling Machine

Shipment of 2,500 foot coils of weatherproofed wire, cartoned and burlaped, has proved very unsatisfactory because of the poor condition in which the goods arrive at destination.



Terkelsen Wire Baling Machine

The bundling machine here illustrated is individually motor driven by a 2 horsepower motor contained in the base of the machine. It is started and stopped by foot levers leaving the attendant's hands free at all times. The coils of wire are laid on the machine table between the upper and lower feed rolls and compressed by turning the hand-wheel at the side which forces the upper rolls downward. The wrapping material is carried by an open gap steel forged revolving shuttle which carries the strip downward through the control space bringing it upward in the rear. As the shuttle revolves the bundle does the same moving at a predetermined rate so that the wrappings overlap uniformly giving a firm, neat, and tight wrap.

Simultaneously with the application of the vertical wrapping an adhesive strip is applied from one side around the middle of the bundle which secures every spiral wrap and prevents any possibility of its unwinding. When desired a printing attachment can be applied to the machine to print on the binding strip any trade mark or other matter while the bundle is being wrapped.

Paper or burlap wrapping can be used as desired. A very satisfactory wrap is obtained at less than for burlap by folding the edges of the paper several times making it impossible to tear or crack the exposed edges of the wrap. The edge folding is accomplished by the machine automatically during the wrapping of the bundle.—Terkelsen Machine Co., 326 A Street, Boston, Massachusetts.

Tire Rim Tool

Any automobile owner who has encountered the problem of mounting or demounting a tire from its rim will appreciate the practical value of a reliable rim tool, and one that folds compactly to fit the tool box. To remove a rim it is but necessary to adjust the hinged arms to grip the rim at the spacing required, turn the crank and lift out the rim. Because of the use of special hooks, it is practically impossible to spring a rim with this tool. The hinged arm feature is an added safeguard against springing the rims—Pacific Rim Tool Co., 16,606 Waterloo Road, Cleveland, Ohio.

Machinery Patents

The United States

1,635,187. APPARATUS FOR COVERING TIRE BEAD RINGS. A pair of oppositely grooved rolls is driven to turn a number of wire tire bead rings about their common axes. While in close concentric relation strips of stock are drawn by the rolls and pressed down around and between the wire rings. The group of covered rings is removed and pulled apart for semi-curing singly or they may be partially cured without confining in molds and later be separated.—Hector V. Lough, Hartford, Connecticut, and Gustave B. Mix, Detroit, Michigan, assignors to Morgan & Wright, Detroit, Michigan.

1,635,243. VACUUM SHAPING MACHINE FOR TIRES. This apparatus permits unshaped "pulley band" built tires to be brought to tire shape in a vacuum chamber easily and rapidly. It comprises a fixed outer wall, an adjustable bottom wall and a lid, the latter being hinged near the vacuum tube connection. A second vacuum chamber is provided on the under face of the bottom wall, open on its inner periphery like the main vacuum chamber. Within the latter chamber a flat band tire construction, sealed at the edges, is drawn into tire form ready for placing in a curing mold.—Adrian O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Michigan.

1,635,647. MACHINE FOR COVERING TIRE BEADS. In tire building practice the beads are universally covered with strip fabric commonly called "flipper strip." The present invention accomplishes this effect by a motor driven machine comprising a bead carrier or expansible chuck on which the bead is carried during the shaping operation. The latter is done by centralizing a strip of adhesive fabric over the bead and while the carrier is rotated at high speed a pair of stitching disks is applied to the skirt of the fabric, gradually drawing it around the bead, sticking the surplus fabric together to form the web or flipper strip on the bead.—William C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,635,710. TUBE SKIVING APPARATUS. This is a motor driven machine for skiving the ends of a length of tubular stock preparatory to the splicing of the ends to form an endless tube. It holds the tube ends firmly during the cutting operation and thus effects an accurate skiving which may be made nearer the end of the tube than has formerly been possible. The tube end is reversed over a hollow conical support which is then advanced into a cylindrical cutter which produces a skiving cut around the tube.—Abram E. Falor, assignor to The B. F. Goodrich Co., both of Akron, Ohio.

1,636,602. CLEANING DEVICE. Removing by hand the hard baked scale that forms upon the platen faces of vulcanizing presses is a slow and expensive method. The power machine of this invention is arranged to operate a revolving disk carrying broad cutters of hardened steel against either upper or lower platen. On the side opposite the cutting mechanism is located a number of open spiral springs which exert pressure upon the cutters by being compressed more or less by the closure of the press.—William J. Kent, Brooklyn, New York, assignor to The Mechanical Rubber Co., Chicago, Illinois.

1,636,595. APPARATUS FOR MAKING SOLID TIRES. This invention is designed to displace the usual method of building solid tires whereby calendered strips of rubber stock are wound in single ply upon a steel tire base, by providing means whereby a number of such adhesive strips may be simultaneously applied to a tire base directly from a calender roll. The advantages thus secured are more rapid and uniform building, greater accuracy and precision of construction and reduction of labor cost.—Harold F. Dumbleton, Cleveland, assignor to The Republic Rubber Co., Youngstown, both in Ohio.

1,636,825. MACHINE FOR PAINTING TIRE CASINGS. In this machine a tire casing may be supported and revolved by motor to facilitate the application of a paint or liquid composition to the walls of its interior. Such treatment renders the surface non-adhesive, thereby preventing the tire casing from adhering to a core upon which it is cured. The design of the machine is such that the tire casing may be held in a manner which permits of inserting a mop saturated with the painting material whereupon the casing is automatically rotated while the mop is held in fixed position.—Grover C. Miller, Los Angeles, California.

1,637,195. TIRE BUILDING MACHINE. This invention relates more especially to building in band form straight side tires in which a wire or metal reinforcing band is employed, although it is equally well adapted to the construction of tires of the clincher type. The essential part of the machine is the building rim in two annular sections having beveled outer edges and tongue and groove connections on the inner edges. The latter may come directly together or be spaced apart so as to receive an expansion ring. The building band is collapsible to strip the tire from it by a partial turn of the hand wheel.—John W. Kuhn, Akron, Ohio.

1,637,207. TUBING MACHINE. This device extrudes rubber in strips instead of a complete single layer tube. Immediately after extrusion the strips are united at their edges to form the complete tube. By this method tubes can be composed of strips of different qualities, kinds or colors, and either straight or spiral. The extrusion press comprises a single compound nozzle and two feeding scrolls or worms each provided with gearing the speed of which can be independently varied to suit requirements. The different qualities of rubber are fed by the respective scrolls to the nozzle and emerge in the form of a single tube; one quality or color of rubber in strip form lying parallel with another and the several strips forming the desired tubing. A mandrel may be employed which may rotate and move endwise to assist the strips to assume a spiral form.—Walter Percy Whitehouse, Gravesend, England.

1,637,466. TUBE SPLICER. This apparatus employs a rigid steam heated tube enclosing mold in combination with an elastic expander which fits the cuff of the tube and presses the splice outward into firm contact with the inner surface of the mold. For the vulcanizing part of the method, the expander is run into the cuff of the tube, held on a hollow mandrel, and separated from the hot mold walls by 2 plies of tubing throughout a semi-circumference and by 4 plies of tubing throughout the other semi-circumference.—Edwin W. Bierman, assignor to Standard Four Tire Co., both of Keokuk, Iowa.

1,637,892. COMPENSATING MECHANISM. This compensating mechanism is designed for use in effecting and maintaining a slack in a moving strip of fabric, and particularly for performing this operation upon a continuous strip of tire fabric which is being fed through a battery of cooperating units for applying various coatings of rubber to the strip. It is intended for use in conjunction with a standard form of rotary drying mechanism, the arrangement being such that both the drier and the compensator may be enclosed in a drying chamber and a great length of fabric be maintained in the chamber in addition to that upon the drier.—Winthrop W. Benner, Cuyahoga Falls, and Edmund A. Hoener, Akron, assignors to The Firestone Tire & Rubber Co., Akron, Ohio.

1,634,919. MACHINE FOR WRAPPING TIRE TAPE, etc. Horace D. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,634,920. TIRE STRIPPER. William C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,634,951. COLLAPSIBLE DRUM. Freeman D. Mason, assignor to The Bridgwater Machine Co., both of Akron, Ohio.

1,635,134. TIRE FINISHING MACHINE. Lloyd E. McCreedy, assignor to The Racine Horseshoe Tire Co., both of Racine, Wisconsin.

1,635,240. APPARATUS FOR MANUFACTURING TIRES. Adrian O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Michigan.

1,635,241. VACUUM SHAPING MACHINE FOR STRAIGHTSIDE TIRES. Adrian O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Michigan.

1,635,242. TIRE SHAPING APPARATUS. Adrian O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Michigan.

1,635,288. WRAPPING MACHINE. Paul Pierce, Chicago, Illinois, assignor to Pierce Wrapping Machine Co., a corporation of Illinois.

1,635,531. BIAS CUTTER, James W. Brundage, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,636,055. COLLAPSIBLE TIRE BUILDING FORM. Frank L. Johnson, Akron, Ohio.

1,636,056. COLLAPSIBLE TIRE BUILDING FORM. Frank L. Johnson, Akron, Ohio.

1,637,205. FLUID HEATING FAUCET, Karl Tramp, Chicago, Illinois.

1,637,441. MOLD FOR COMBINATION HEELS. Leon B. Conant, Cambridge, assignor to George M. Conant, Bridgewater, both in Massachusetts.

1,637,450. HAND ROLLER. Frederick H. Martin, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,637,465. TUBULAR MOLDING APPARATUS. Edwin W. Bierman, assignor to Standard Four Tire Co., both of Keokuk, Iowa.

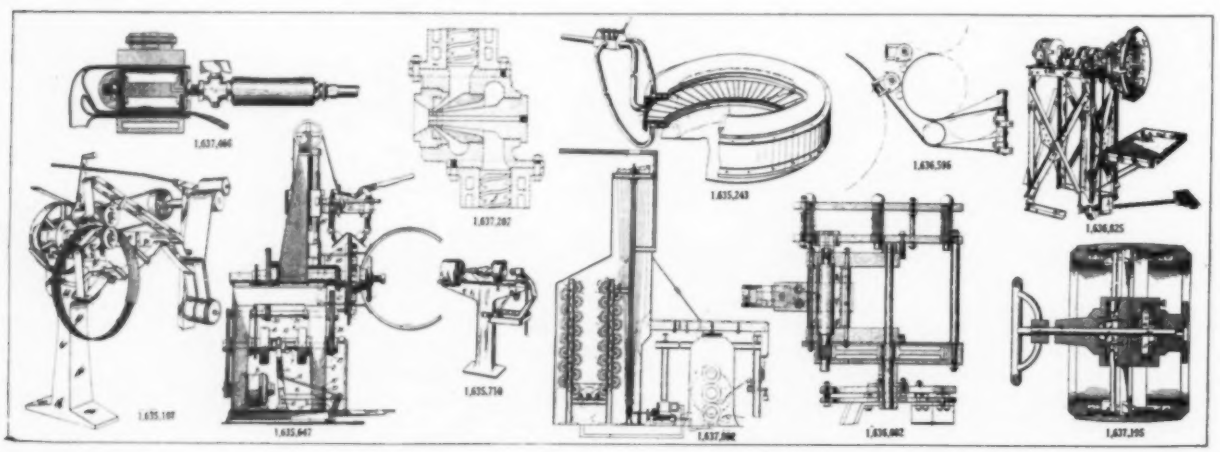
1,637,467. CUFFING DEVICE FOR INNER TUBES. Edwin W. Bierman, assignor to Standard Four Tire Co., both of Keokuk, Iowa.

1,637,784. CALENDER KNIFE. Kimball Oyler, Los Angeles, California, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio.

1,637,794. KNIFE BRACKET FOR TIRE MACHINES. Dayton L. Williams, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,637,879. TIRE REPAIR VULCANIZER. Clyde M. Semler, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,637,931. REPAIR VULCANIZER. Paul François Marc Albert Fontana, Cluses, assignor to Societe des Appareils Mephisto Jules Manfredi & Cie., Cluses (Haute-Savoie), both in France.



Dominion of Canada

272,152 ELECTRICAL VULCANIZER. The Edward G. Budd Manufacturing Co., assignee of Joseph Ledwinka, both of Philadelphia, Pennsylvania, U. S. A.

272,255 TIRE REPAIRING TOOL. Joseph J. Fuchs, Minneapolis, Minnesota, U. S. A.

272,404. FOOTWEAR APPARATUS. Charles Horace Russell Collins, Marrickville, near Sydney, New South Wales, Australia.

272,496. TIRE BUILDING MACHINE. The Fisk Rubber Co., Chicopee Falls, Massachusetts, assignee of George F. Wikle, Milwaukee, Wisconsin, both in U. S. A.

272,528. TIRE VULCANIZER. The Seiberling Rubber Co., assignee of Karl B. Kilborn and William S. Wolfe, all of Akron, Ohio, U. S. A.

272,532. HEEL ATTACHING MACHINE. The United Shoe Machinery Co. of Canada, Ltd., Montreal, Quebec, assignee of John Benjamin Hadaway, Swampscott, Massachusetts, U. S. A.

272,561. TIRE MOLD. James Francis and William Thomas Barnes, Hawthorn, and Michael David Kennedy, Richmond, both in Victoria, Australia.

272,604. SHOE SOLE MOLD. Euclide Israël LaChapelle, Brockton, Massachusetts, U. S. A.

272,706. BIAS CUTTER. The Miller Rubber Co., assignee of James W. Brundage, both of Akron, Ohio, U. S. A.

United Kingdom

270,369 APPARATUS FOR TWISTING AND PROOFING YARNS. J. E. Moore, 56, Newton street, Manchester.

270,549 SUPPORT FOR DRYING FRESHLY PAINTED GOLF BALLS. T. Grave, 23, North street, Maryport, Cumberland (J. C. Grave, Singapore, Straits Settlements).

271,070† RUBBER TREATING MACHINES. Farrel Foundry & Machine Co., assignee of R. C. Lewis, both of Ansonia, Connecticut, U. S. A.

271,075 MACHINE FOR TREATING RUBBER. Farrel Foundry & Machine Co., assignee of R. C. Lewis, both of Ansonia, Connecticut, U. S. A.

271,167 BEAD FLIPPER. F. B. Dehn, 103, Kingsway, London (Utility Manufacturing Co., Cudahy, Wisconsin, U. S. A.).

271,230 REPAIR VULCANIZER. R. V. Rawnsley, 1, Hill Top avenue, Roundhay Road, Leeds.

271,462† TIRE RETREADING APPARATUS. Soc. des. Procédés Fit, 26 Rue St. Jacques, Grenoble, Isère, France.

271,630. REPAIR VULCANIZER. Dunlop Rubber Co., Ltd., 1, Albany Street, Regent's Park, London, and T. Norcross, Dunlop Rubber Co., Ltd., Fort Dunlop, Erdington, Birmingham.

† Not yet accepted.

New Zealand

57,796 REPAIR VULCANIZER. William Peter Stevens, 333 Main street, Palmerston North.

France

616,963 RETREADING MOLD. A. E. Burch.

617,312 TRUE TREAD VULCANIZER. Societe des Procedes Fit.

617,694 MOLDS FOR HOLLOW GOODS. J. Goldstein.

617,729 EQUIPMENT FOR MANUFACTURING INFLATED ARTICLES. Etablissements Adeline.

617,779 HYDRAULIC PRESS. Hydraulic G. m. b. H.

619,465 TUBE VULCANIZER. W. L. Fairchild.

619,864 TIRE RETREADING APPARATUS. Societe des Procedes Fit.

619,929 MIXER. M. Nairn.

620,878 MACHINE TO FORM AND DRY MATERIAL IN SOLUTION. A. Boecler.

Designs

Germany

995,287 VULCANIZING APPARATUS. Erich Norchard, Georgenstrasse 31 Berlin-Schlachtensee.

Process Patents

United States

1,634,293 MANUFACTURE OF MOLDED ARTICLES FROM LATEX. Chauncey C. Loomis, Yonkers, and Horace E. Stump, Brooklyn, both in New York, assignors by mesne assignments to The Hevea Corp., a corporation of New York.

1,634,955 MAKING PATTERNED RUBBER SHEETING. Tod J. Mell, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,635,196 CORD TIRE FABRIC. Samuel A. Steere, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,635,576 DIPPED RUBBER ARTICLES. John Hadfield, assignor to John R. Gammeter, both of Akron, Ohio.

1,635,684 MAKING DECORATIVE SHEETING. Tod J. Mell, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,636,335 OPHTHALMIC MOUNTINGS. Arthur Leroy McKinstry, Southbridge, Massachusetts, assignor by mesne assignments to Bausch & Lomb Optical Co., Rochester, New York.

1,637,885. PRODUCING FUR BEARING SHEETS USED IN THE MANUFACTURE OF GARMENTS AND GARMENT TRIMMINGS. Hyme Wasserman, Brooklyn, New York.

Dominion of Canada

272,051 COMPOSITE LAMINATED STRUCTURES. Harry Nelson Atwood, Monson, Massachusetts, U. S. A.

272,052 COMPOSITE VEHICLE WHEELS. Harry Nelson Atwood, Monson, Massachusetts, U. S. A.

272,410. RUBBER ATTACHING METHOD. Frank James Davis, London, S. W. 12, England.

272,624 PRINTING PROCESS. William Frailey McKannay, San Francisco, California, U. S. A.

272,661 MAKING PNEUMATIC TIRES. The Bawden Machine Co., Ltd., Toronto, Ontario, assignee of Barthold de Mattia, Clifton, New Jersey, U. S. A.

272,903. HEEL. Leon Bassett Conant, Cambridge, Massachusetts, U. S. A.

United Kingdom

271,355 INFLATABLE BALL. I. Dorogi, L. Dorogi and Dr. R. T. Dorigi és Társa, Gummigyár, 50 Albert-falva, Budapest.

271,608. ORNAMENTING FABRICS. C. E. Phipps, Wind Whistle, Stanley Hill, Amersham, Buckinghamshire.

Germany

447,205 METHOD OF PRODUCING A SELF-ACTING PACKING AGENT FOR HOSE. Selecta Arndt & Muller G. m. b. H., Weissfrauenstrasse 8, Frankfurt a. Main.

France

616,902 PUNCTURE PROOF DEVICE. M. Wiesenthal.

617,693 HOLLOW RUBBER GOODS. J. Goldstein.

618,031 TIRES. A. Lagruta.

618,400 INNER TUBES. The Dunlop Rubber Co., Ltd.

618,819 SOLID RUBBER TIRES. Edras Ltd.

619,401 MULTICOLORED RUBBER GOODS. The B. F. Goodrich Co.

619,526 RUBBER GOODS FABRIC. The Hartford Rubber Works, Co.

619,715 INNER TUBES. W. L. Fairchild.

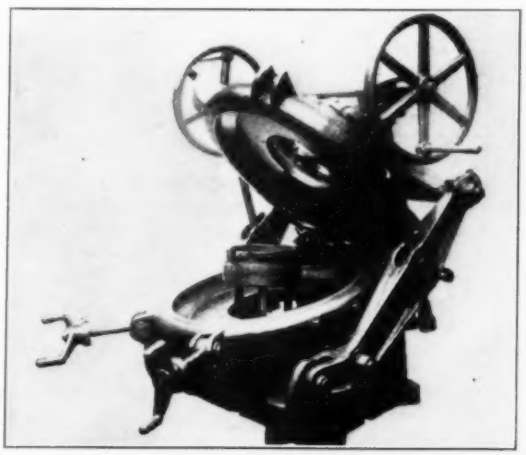
619,965 TREATING RUBBER. The Dunlop Rubber Co., Ltd.

620,106 VULCANIZING RUBBER BETWEEN SPRING PLATES. H. C. Lord.

Large Tire Vulcanizer

To the well-known Clampress tire vulcanizer invented by Colin Macbeth for small size tires, the makers have added one of the same type for curing large tires. The illustration shows it in open position. Service tests of a large battery of these vulcanizers have shown very satisfactory performance.

This press operates in the horizontal position which for years has been found eminently satisfactory for airbag made tires. As



Macbeth Clampress Tire Vulcanizer

is evident from the picture, the tire rests complete with its clip rings on a little table, is automatically gripped and later automatically stripped from the mold. The two swing bolts at the front are required only for extreme internal pressure in order to prevent the possibility of any spring at the front of the press.

The vulcanizer is absolutely safe against accidental opening and the gearing provided obviates the necessity of heavy work on the part of the operator. All of the parts subject to internal pressure are made of steel. By reason of the absence of all projecting balance weights the press occupies a minimum of floor space.—Rogers Wilson & Co., Birmingham, England.

Obituary

Leading Manufacturing Chemist

Caesar Augustin Grasselli, chairman of the board of the Grasselli Chemical Co., died July 29 after an operation in a hospital in Cleveland, Ohio. Mr. Grasselli was seventy-seven years of age and was one of the leading manufacturing chemists of the country. For more than thirty years he was president of the Grasselli company, resigning that office in 1910 in favor of his son, Thomas S. Grasselli.

Pioneer Rubber Tire Manufacturer

Charles H. Semple, head of the Semple-Lee Processes, Inc., Akron, Ohio, passed away August 1 at the Monmouth Memorial Hospital, Long Branch, New Jersey, after a short illness. Death was due to paralysis.

Mr. Semple was a native of Indianapolis, Indiana, where he was president of the G. & J. Tire Co., after which he was affiliated with the Empire Tire Co. for many years. In 1914 he founded the Semple Rubber Co., Trenton, New Jersey, and in 1922 became president of the Semple Manufacturing Co., at Brookville, a suburb of Trenton.

A new method of manufacturing inner tubes was developed by Mr. Semple, for which he secured patents only a short time before his death, and he formed the Semple-Lee Processes, Inc., Akron, Ohio, patentees for the method.

Mr. Semple is survived by his widow, Mary Barrett Semple; two brothers, Miller Semple of Philadelphia, and Edward Semple of Chicago. He was a member of the Trenton Club, Trenton Country Club and the Carteret Club, of Trenton. The funeral services were held in the Ewing Church Cemetry, near Trenton.

George Bendelari

George Bendelari, former statistician of THE INDIA RUBBER WORLD, died August 12, at his home 911 Fulton street, Brooklyn, New York. Mr. Bendelari was born in Naples, Italy, in 1851, and was educated at Harvard University, where he was Kirkland Fellow from 1875 to 1878. He was an instructor in modern languages at Harvard, and held a similar position at Yale for six years. From 1894 until 1917, Mr. Bendelari was book review editor on The Sun, and served as a member of the United States Postal censorship from 1917 until the close of the war. He then became associated with THE INDIA RUBBER WORLD, leaving in 1920 to join the research division of the Federal Reserve Bank, which position he held until his death.

Sir Harry Johnston

The death recently of Sir Harry Johnston, G. C. M. G., will be of interest to many in the rubber industry, as he was an authority on the government, fauna, flora, languages and native populations of the British African Empire. He was at one time connected with the Liberian Rubber Corporation, and had made a reputation for himself in literature, his activities as Vice-Consul in the Cameroons yielding him a wealth of material.

Last Rites for John J. Shea

The funeral of John J. Shea, vice president of the Hartford Rubber Works Co. and the Providence Rubber Co., subsidiaries of the United States Rubber Co., was held July 22 from his late home, 24 Annawan street, Hartford, Connecticut.

John J. Shea.

The factory of the Hartford Rubber Works company was closed for the day and the funeral was attended by seventy-five members of the Foremen's Club. Many other employes of the company were present and the honorary bearers included officers of the company, representatives of the United States Rubber Co. and several of the subsidiaries. All the factories of the United States Rubber Co. were closed during the hours of the funeral.

Mr. Shea was one of the most popular men at the Hartford Rubber Works both with the men and his associate officers. Risen from the ranks of the ordinary workmen he always retained his simple and unaffected manner, and was a man of marked sincerity and great capability.

Mr. Shea is survived by his wife; a daughter, Madeline M. Shea; and three sons, John J., Jr., Cornelius and Irwin Shea, all of Hartford.

RIM SIZES OF BALLOON TIRES

Finding the rim diameter of any size of balloon tire can be done by using the same method as for high pressure tires. The sectional size is multiplied by two, and the result is deducted from the wheel size. The 30 by 3½ high pressure tire is an illustration. Twice times three and one half equals seven, and seven from thirty leaves twenty-three. Answer —a 23-inch rim.

In computing the size of the balloon tire rim, the fractions must be disregarded. For example: the sectional size 5.25 or 5.77 must be considered as five inches, and the same method used for the decimals with the six- and seven-inch sizes. The rule does not work however with the three grades of 4-inch balloons, the method being to consider two of them as 4½ inch tires, and the 4.40 size as representing four inches.—*U. S. Tire Retailer.*

GOLF BALL IMPORTS

The total number of golf balls imported in the first half of 1927 numbered 1,590,971 as compared to 1,715,631 in the same period of 1926, according to figures prepared by the Department of Commerce. The total imports for 1924 were 2,834,340, value $1,057,711; for 1925, 2,806,383, value $1,165,864; while 1926 figures were 3,361,248 with a value of $1,377,205.

NEW BULB SYRINGE

Under the name of Lavate, a new German vaginal bulb syringe has been put on the market. The distinguishing feature of the syringe, which is all rubber, is a polygonal-shaped concave disk of soft rubber surmounted by a sponge rubber cushion which has been fixed about midway of the length of the bent hard rubber tube. Simplicity of operation, comfort, durability, are claimed for Lavate, which is manufactured by Ernst Erler, Berlin-Friedenau, Germany.

RUSSIA PLANTS COTTON

Up to May 1 of the present year, 1,700,000 acres of cotton have been planted in Russia, according to information received by the American-Russian Chamber of Commerce. This total is said to represent 81.5 per cent of the original plan, while in 1928 2,150,000 acres are to be devoted to cotton culture.

Editor's Book Table

"Aging of Soft Rubber Goods." R. F. Tener, W. H. Smith, and W. L. Holt. Technologic Paper No. 342. Department of Commerce, Bureau of Standards, Washington, D. C., 1927. Paper, 42 pp., 7 by 10 inches. Illustrated.

In this investigation typical rubber compounds were prepared and subjected to different conditions of exposure, etc., to determine the influence of various factors, such as light, heat, oxygen, moisture and the degree of vulcanization on the deterioration of rubber goods. Details are given of the compounds, test conditions, methods and apparatus followed by discussion of the results of the physical and chemical tests and the effects of different factors influencing deterioration.

"Bulletin of the National Research Council." July, 1927, No. 60. Third Edition. Revised and enlarged. Compiled by Clarence J. West and Ervye L. Risher for Research Information Service, National Research Council. Published by The National Research Council of The National Academy of Science, Washington, D. C.

This third revised compilation presents data for 1,000 industrial research laboratories concerning which the following information is given for each entry: name and address of the company and address of laboratory if different from that of the company; name of director of research and number on his staff; chief lines of research. In addition to the alphabetical list of laboratories, there is given a subject classification, address list of directors of research, and geographical distribution of laboratories. The rubber industry is represented by 53 laboratories.

Abstracts of Recent Articles

RUBBER AS A CONSTRUCTIONAL MATERIAL IN CHEMICAL ENGINEERING. This paper discusses caoutchouc, its nature, physical characteristics, preparatory processes, specialized methods of vulcanization, tensile properties, chemical engineering, physical properties and aging.—B. D. Porritt, *Rubber Age*, London. Serial.

THE ELECTRO-DEPOSITION OF RUBBER. General account.—Anonymous. *I. R. Jour.*, July 30, 1927, pp. 179-180. Illustrated.

CYCLE INNER TUBES. Description of manufacture—Anonymous. *I. R. Jour.*, August 6, 1927, pp. 211-212, and 217. Illustrated. German translation.

VULCANIZATION BY THE VAPOR OF SULPHUR CHLORIDE.—J. Panem, *I. R. Jour.*, August 6, 1927, p. 220.

THE BLENDING STRENGTH OF EBONITE.—H. Brandt, *I. R. Jour.*, August 6, 1927, pp. 222-23. Graphs and table. German translation.

RUBBER SPONGE IN LONG LENGTHS. Manufacturing note.—Anonymous. *I. R. Jour.*, August 6, 1927, p. 224.

NATURE OF MATURED SLAB RUBBER AND THE ACCELERATING POWER OF POTASSIUM SALTS. The author considers the practical duplication of matured rubber by adding its equivalent accelerators to smoked sheet.—C. C. Davis, *Rubber Age*, N. Y., August 10, 1927, pp. 453-458.

ULTRAMICROSCOPIC INVESTIGATIONS OF RUBBER FILLERS.—H. Pohle, *Zeitschrift für Wissenschaftliche Mikroskopie* und für *Mikroskopische Technik*, 14, 1927, pp. 183-195.

STEARIC ACID AS A RUBBER COMPOUNDING INGREDIENT.—W. B. Wiegand, *Canadian Chem. & Met.*, August, 1927, pp. 211-12.

DYNAMOMETER TEST OF BRAKE DRUM HEAT IN DUAL WHEELS.—C. W. Bedford and Ernest Blaker, *Jour. S. A. E.*, August, 1927, pp. 160-170. Illustrated, graphs, discussion.

TIRES AS A CAUSE OF SHIMMY.—K. L. Herrmann, *Jour. S. A. E.*, August, 1927, pp. 135-145. Illustrated, graphs discussion.

EBONITE MANUFACTURE. Part V. Ebonite tubing separators, and battery boxes.—R. M. Unger. *I. R. Jour.*, June 23, 1927, p. 141. Serial.

THE PRESERVATION OF FRESH FRUIT WITH LATEX. A discussion of development up to the present time, with a description of new experiments. So far results are satisfactory—W. Spoon, *Rubber Age*, London, 8, 1927, pp. 157-9.

FERTILIZING EXPERIMENTS WITH RUBBER. I.—J. F. Schmöle, *Archief*, 10, pp. 233-88 (1927). In English, pp. 289-301.

REPORT FROM THE IMPERIAL INSTITUTE ON SAMPLES OF PLANTATION RUBBER.—Ceylon Technical Committee. *Trop. Agr.*, Ceylon, 68. pp. 146-51 (1927).

RESULTS OBTAINED FROM AN INQUIRY ON RUBBER PREPARATION HELD IN BESOEKI IN 1925.—L. R. Van Dillen. *Archief* 10, pp. 443-69 (1926). Summary in English, pp. 470-4.

RUBBER FROM BUDDED TREES. II. Investigations of latex and rubber from some budded trees in the Cultuurtuin (Economic Gardens) and their mother-trees.—O. de Vries and W. Spoon. *Archief*, 11, pp. 112-45 (1927). Summary in English pp. 146-9.

STUDIES ON HEVEA LATEX. VI. The proteins in serum from frozen latex.—R. O. Bishop. *Malayan Ag. Jour.*, 15, pp. 27-34 (1927).

CHANGES UNDERGONE BY CRUDE AND VULCANIZED RUBBER AND AGING TESTS.—J. Ch. Bongrand. *Chemie et Industrie*, 17, pp. 541-5 (1927).

PRODUCTION OF RUBBER ARTICLES FROM VARIOUS PRESERVED RUBBER LATICES AND PREVENTION OF THE DEVELOPMENT OF TACKINESS.—R. Ditmar, *Gum.-Zeit.* (1927), 41, pp. 1688-1689.

INFLUENCE OF LIGHT ON RUBBER IN TECHNICAL PRACTICE.—Keiichiro Asano, member Kyoto University (1926), No. 3, 267; *Gum.-Zeit.*, 41, pp. 1576-7.

RUBBER. I. Its origin, use and production.—J. Ch. Bongrand. *La nature*, 1927, pp. 153-9. An illustrated description. II. Production in the French colonies. *Ibid*, pp. 206-9. Illustrated. III. Transformations and uses. *Ibid*, pp. 297-300. Illustrated, including the creping and smoking processes, mixing, calendering, tubing, vulcanizing, the use of latex, and future developments.

THE INFLUENCE OF BUTYRALDEHYDE-AMMONIA IN VULCANIZATION.—C. A. Hallas and T. J. Drakeley, *J. Soc. Chem. Ind.* 46, pp. 178-9T (1927).

THE COLOR EFFECTS OF INORGANIC AND ORGANIC RUBBER-COLORING AGENTS WITH ACCELERATORS OF VULCANIZATION.—Rudolf Ditmars. *Chem.-Ztg.* 51, pp. 332-3 (1927).

THE ROOT SYSTEM OF GREEN MANURES AND OF HEVEAS.—Dr. W. Bobilioff. *Archief*, June, 1927, pp. 215-216. English version, pp. 217-218. Illustrated.

WEIGHING SOLE CREPE TO CONTROL THE UNIFORMITY OF THICKNESS.—Dr. R. Riebl. *Archief*, June, 1927, pp. 219-228. Tables, English version, pp. 229-234.

RESEARCHES ON THE PHYSIOLOGICAL SIGNIFICANCE OF LATEX IN PLANTS.—Dr. W. Bobilioff. *Archief*, June, 1927, pp. 235-247. References, English summary.

VULCANIZATION OF CONCENTRATED LATEX.—Dr. Philip Schidrowitz. *Kautschuk*, June, 1927, pp. 202-203.

RUBBER AND RUBBER MIXINGS FROM THE STANDPOINT OF ENERGY CONSIDERATIONS.—Dr. Lothar Hock (after experiments by Siegfried Bostroem and Friedrich Hartner). *Kautschuk*, June, 1927, pp. 207-215. Tables, graphs, discussion.

THE PROBLEM OF POLYMERIZATION AND OF RUBBER.—Dr. J. R. Katz (after experiments in part with J. Selmann and Frl. L. Heyne). *Kautschuk*, June, 1927, pp. 215-222.

THE BRIDGE-BANBURY AUTOMATIC MIXER. *Le Caoutchouc*, July 15, 1927, pp. 13,623-13,625. Illustrated.

THE ACCELERATOR, B. B.—Illustrating its application. 1. *Rev. Gén. Caoutchouc*, July, 1927, pp. 6-9. Graphs, formulas.

WHAT RACING SPEED OWES TO THE TIRE.—Henry Petit. *Rev. Gén. Caoutchouc*, July, 1927, pp. 6-9. Graphs, formulas.

THE FUTURE OF RUBBER. 1.—J. Dugue. *Rev. Gén. Caoutchouc*, July, 1927, pp. 23-25.

New Trade Publications

Herbert Morris, Inc., Buffalo, New York, has issued a new catalog, entitled Morris Runways, descriptive of the industrial overhead track system of the company.

DeMattia Brothers, Inc., Clifton, New Jersey, has compiled a bulletin of balloon tire sizes. The list shows 32 sizes, 29 of which are furnished as original equipment on 1927 cars. During the past few months 13 new sizes have been added of which 3 are 18 inch rim diameter, 7 are 19 inch, 2 are 20 inch and 1 is 21 inch. The chart shows that while the 20 and 21 inch rim diameter sizes are most popular at present, there is an increasing trend toward the 18 and 19 inch diameters.

The Bristol Co., Waterbury, Connecticut, has just issued a new electrical catalog, No. 1502, Ammeter section.

"Modern Tube Production Methods," by M. A. Flynn, is a bulletin issued by The Akron Equipment Co., East Exchange street, Akron, Ohio, and deals with molded inner tubes.

The B. F. Goodrich Rubber Co., Akron, Ohio, has compiled a bulletin of special rubber goods for the chemical manufacturing industry.

The Barco Manufacturing Co., 1801-1815 Winnemac avenue, Chicago, Illinois, announces two new catalogs: one illustrating flexible joints for platen presses; the other for oil, steam, air and gasoline, water and other fluids, gases and liquids where a flexible conveyer is required.

Rubber Compounding Practice

(Continued from page 308)

when employed in proportions from 3 to 15 volumes to 100 volumes of rubber. The maximum effect is found at 7 volumes per 100 volumes of rubber. This statement is proved by experiments on tensile at break, energy input, and resilience. Beyond 15 volumes to 100 volumes of rubber, MR is practically inert as is shown by stress-strain curves, ultimate elongation, energy input, and resilience.

MR is essentially a plastic material and while it is subject to considerable plastic flow, very little of this flow is irreversible. This is demonstrated by hysteresis loss in experiments ni comparison with black and zinc oxide, permanent set experiments, elongation under constant load, and recovery.

A remarkable agreement is shown by a comparison of the slopes of the curves for permanent set with hysteresis loss for MR, zinc oxide and gas black.

When present in compounds in excess of 15 volumes of MR to 100 volumes of rubber, a decided logginess is imparted. The limit at which logginess first appears is considerably dependent on the quantity of other filler present. In pure gum 15 volumes is the limit. This logginess is simply a slowing up of the recovery. MR thus acts similarly to a door check and while the eventual recovery is the same as for pure gum, this is a most serious objection to more extensive use of MR. In service, complete recovery from blow to blow is prevented and the effect of successive impacts becomes more serious than if the stock had the property of rapid recovery.

The importance of MR in the rubber industry is indicated by the estimated tonnage used by the American rubber industry in 1926 compared with the consumption of crude and reclaimed rubber in the United States.

CRUDE RUBBER, RECLAIM AND MINERAL RUBBER CONSUMED IN THE UNITED STATES

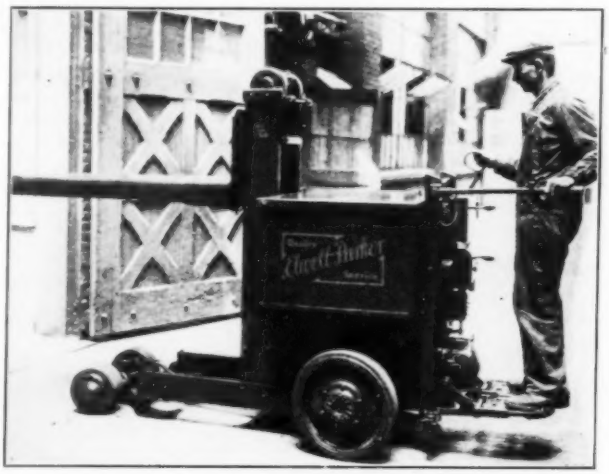
Materials	Tons in 1926 (Estimated)	Percentages Relative to Crude
Crude rubber	365,000	..
Reclaims	165,000	45
Mineral rubber	30,000	8

For 1927 the total tonnage of MR for all purposes in the United States is estimated at 48,000 tons. Of this about 12,000 tons is being consumed in the manufacture of storage battery boxes of cold pressed plastic. Such boxes are not highly successful and are said to be decreasing in favor, while hard rubber boxes are gaining.

Electric Tiering Tructor

The tiering truck here pictured is the 2-ton member of a series, the other sizes of which are 3 and 6 tons. This machine is designed to handle skid loads as in regular power lift truck service or it elevates the load from the floor 4 to 8 feet when tiering or stacking in storage, stock room or delivering goods to motor truck or to railroad car from rail level to car floor.

The new machine is of all steel construction and built on the interchangeable parts basis. The power plant is of the unit enclosed type, steel brake drum, chrome vanadium drive shafts and universal joints to permit steering and the delivery of power to the steel clutch plates bolted to outside of the drive wheels. These are fitted with solid rubber tires and Timken tapered bearings. The operator's pedals, one for brake the other for controller reverse drum are constructed with a heel rest non-slip surface, and are spring folded when the operator leaves the truck. The braking



Elwell-Parker Tiering Tructor

and power application is separate to provide for incline operation.

The removable controller handle is self-returning to off-position when released. The lift controller located beneath the driving motor controller is also of the drum type. The handle is lifted to elevate the load and reversed to lower it. An automatic trip device returns the drum to off position when load platform reaches its highest or lowest position or it can be returned to off position manually at the will of the operator.

The platform is a solid plate of steel with edges bent into a deep skirt and with heavy angles welded down the middle for attachment to steel support arms. The machine is a high speed tool that is built for various height lifts and with several size platforms to suit materials handled. It is especially designed for the lighter manufacturing branches of industry as well as warehouse, railroad stores, shops and steamship terminal work and will fit practically any electric or hand lift truck skid built.—The Elwell-Parker Electric Co., Cleveland, Ohio.

GOODYEAR TIRE & RUBBER CO. OF CANADA

Goodyear Tire & Rubber Co. of Canada, Ltd., will issue one and one-half shares of common stock to the present holders at $1, which is practically equivalent to the declaration of a stock bonus of 150 per cent a share. As there are at present 53,000 shares of common stock outstanding, this will mean a distribution of about 79,000 shares at a purely nominal figure. It is understood that the shares now created will come in for a dividend in the not distant future, but nothing was said as to this following the meeting, although in some quarters it is hinted that as high as $5 per share per annum is mentioned.

New Goods and Specialties

Water Ballasted Decoy Duck

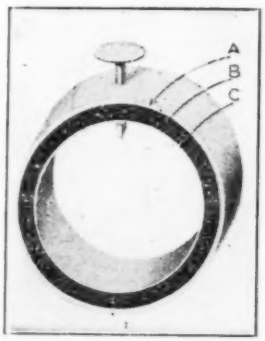
Wooden decoy ducks are often heavy, clumsy, and unlifelike. Now mallards,

Rubber Duck

canvasbacks, redheads, blackducks, and pintails are cleverly imitated in nearly pure gum rubber forms that are collapsible, inflatable, and water ballasted with colors that do not check or peel. Empty, such a duck weighs 5 ounces, or water-weighted 30 ounces. Made by the Eno Rubber Corporation, Torrance, California, for the Carlton-Stoner Corporation, Los Angeles, California.

Molded Self Healing Tube

The Sherbondy self healing inner tube utilizes the tenacity of an intermediate layer chiefly of crude rubber made non-vulcanizable for resisting



Sherbondy Inner Tube

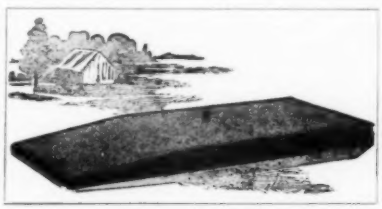
puncture. The tube is circular-molded, having at "A" outer laminated layers of cured tube stock, at "B" the non-curable layer, and at "C" a coating of cured tube stock. It is claimed that the tube can not leak or be overheated, and that it is practically imperforable and indestructible. Edward L. Sherbondy, inventor; Sherbondy Rubber Co., Norwalk, California, manufacturer.

Vogue Dress Shield

A shield made to be used in georgette sleeves, which is both inconspicuous and light in weight, has attained great popularity. The Vogue shield is produced in colored gum in 15 different shades, covered with nainsook to absorb the perspiration, and lined with white silk through which the gum interlining is visible on the inside, the color matching the color of the georgette. The shield is made in three sizes in regular and crescent shapes.—I. B. Kleinert Rubber Co., 485 Fifth avenue, New York, N. Y.

Air Camp Pad

A restful, one-piece bed of pure Para rubber, as easily carried as a blanket and which may be used on the ground or in a sleeping bag, the Brownie air camp pad reaches from the shoulders to

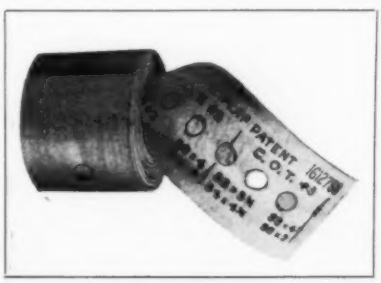


Brownie Pad

the knees. It is easy to inflate without the aid of a pump and can be rolled in a small bundle. The pad is made in four different sizes, weighing from four to seven pounds.—Metropolitan Camp Goods Co., Inc., Athol, Massachusetts.

One-for-All Tire Flap

A flap which lessens the number of sizes which a dealer must carry in stock, and prevents an autoist, when he goes to put a new flap on a tire, finding that he has the wrong size, is manufactured by C. O. Tingley & Co., Rahway, New Jersey. The flap is made long with markings for cutting it off for smaller sizes. It makes a tight and imperforate closure when used full size, and yet can be cut down quickly and accurately if desired. The holes are



Tingley Flap

readily made with a small bladed penknife by folding the flap lengthwise, and cutting into the doubled edge upon the markings.

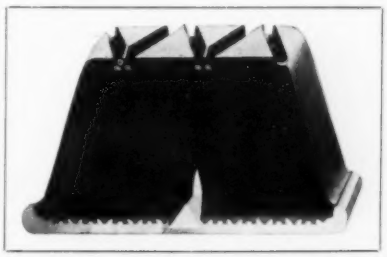
Zip Lock

Drizzle Proof Golf Jacket

A practical rain proof golf jacket with an easy lock fastener, recently improved by the addition of a reinforced lock which eliminates the objectionable sliding common to most fasteners. The jacket is well tailored from a laboratory tested rubberized fabric of pliable texture and of durable construction. It is cut full, allowing for freedom of motion, with three vent holes under the armpits for ventilation. With the jacket comes a small rubber bag into which it fits and which may be carried by the caddy around the golf course.—Safety Jack Corporation, 16-17 East 16th street, New York, N. Y.

Cushion Truck Tire

Announcement has been made by the Goodyear Tire & Rubber Co., Akron, Ohio, of a new super-pneumatic truck tire which



Section of Super-Pneumatic Tire

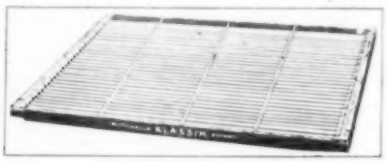
has been designed to meet the demand for a tire to carry heavier loads with better cushioning. The new tire is especially recommended for use on trucks carrying oil, packer's supplies, baking and food products, and other similar transportation needs.

More rubber is used resulting in better tread wear, the great mass of rubber absorbing shocks easily. Abrasion is reduced as impacts are reduced. The five-inch size is one-half inch higher than the standard pneumatic cushion; the six-inch, six-tenths of an inch higher; the seven-inch, one inch higher; and the eight-inch, one and one half inches higher than any previous tire

built by Goodyear. The nine, ten and twelve-inch are altogether new, the two latter are full six inches from tread to base. Three sizes, 36 by 5, 36 by 6, and 36 by 7 are also built.

Hygienic Mattress

Proper rest is essential to renew the energy of the body, and the manufacturer of the Klassik hygienic mattress claims to have embodied all the principles of hygiene put forward by the medical profession. Starting from the basic principle of a steel spiral wire covered with an imperishable rubber com-

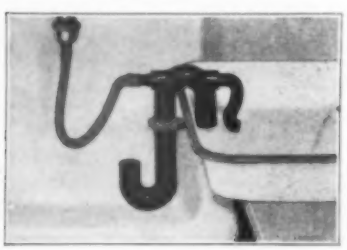


Klassik Mattress

position, a constructional system of mattress has resulted which is sagless, hygienic and extremely comfortable. Strands of rubber-steel cable, arranged in an entirely new way across sections of chrome leather, give perfect cushioning comfort to every part of the body, and it is further claimed that the mattress is rust, germ and dust-proof. The Rubber Steel Patents, Ltd., No. 7 Alfred street, Belfast, Ireland.

Automatic Tray Siphon

A new and simple way to wash prints employs a siphon of hard rubber which is held in place on the edge of the tray by means of a soft rubber buffer. A rubber tube connects it to any cold water outlet, bringing fresh water constantly in contact with the prints. Where the volume of work necessitates the use of several washing trays, the siphons may be hooked up in series and one tray after another washed with equal efficiency by the one

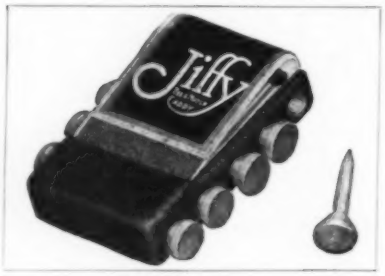


Eastman Siphon

stream.—Eastman Kodak Stores, Inc., 356 Madison avenue, New York, N. Y.

Tee and Match Caddy

A handy pocket container for tees and matches made of durable light weight black suede finish rubber, the Jiffy caddy is so designed that the tees readily slip in and out but are yieldingly held by the con-



Jiffy Container

traction of the rubber at the base of the cavity. It will carry either a book of safety matches, or ten of the long wooden ones, and is provided on the back with a durable striking surface for the latter type of match.—Golf Specialties, Saginaw, Michigan.

Dredge Sleeve Clamp

The King clamp fills in a most practical way a need for a commercial dredge sleeve clamp. An outstanding feature is the saddle which is provided with a double tongue and is quite long. This arrangement keeps the saddle set on the sleeve, and the clamp proper slides over the tongue easily and prevents jamming of the sleeve, giving adequate clamping

King Clamp

strength, whether the clamp extends ¼ or 1½ inches over the tongue of the saddle. The clamp is made in both single and double bolt types. As shown in the illustration, the bolts are at the top of the clamp instead of the sides, permitting greater ease in attaching or detaching from the sleeve.—Dixon Valve & Coupling Co., Emerald and Hagert streets, Philadelphia, Pennsylvania.

Rubber and Fabric Horseshoe

Rubber horseshoes to save animals from jarring, to lessen noise, and to prevent pavement damage have been tried over thirty years. A new one uses no metal part, is cut flat from heavy tread stock, has six plies of tire fabric and is cheaper and lighter than metal shoes. Made by the Eno Rubber Corporation, Torrance, California, for West Coast Stables, 1612 South San Pedro street, Los Angeles, California.

Compressed Rubber Wheels

The Ce-aR wheels, for trucks and trolleys, are made entirely of compressed rubber, and have many advantages over other types of wheels. They are noiseless, unbreakable and resilient, cause no damage to concrete or wooden floors and do not require retreading or retireing. The initial cost is low and the annual maintenance greatly reduced.

Ce-aR Wheel

The wheels are not affected by hot, cold or damp climates, and a varying degree of hardness is procurable according to the maximum expected load.—Compressed Rubber Products, Ltd., Zenith Works, Villiers Road, Willesden Green, London, N. W. 2, England; W. R. Loxley & Co., 30 Church street, New York, N. Y., agents.

Traffic Direction Signal

Experiments in new forms of traffic direction signs are being tried out at Charing Cross station, in England, the signals designed to stand out conspicuously. One type is composed of black rubber letters inlaid in aluminum troughs which are, in turn, let into blocks of white rubber.

Aviation Goggles

The great impetus given to aviation by the recent thrilling long distance flights has created a strong demand for the goggles illustrated, according to the manufacturer, Sellstrom Manufacturing Co., 1113-1119 North Franklin street, Chicago, Illinois. The Excel goggles are all bound with cushion rubber, with bent lens or flat tripex of white metal or leather sides, and

Excel Goggles

are made with an adjustable nose bridge, and may be had in various sizes.

Financial and Corporate News

The Fisk Rubber Co.

Fisk Rubber Co., Chicopee Falls, Massachusetts, reports for the eight months ended June 30, 1927, net profits after all charges of $1,717,307, compared with $2,124,593 for the six months ended April 30, 1926, and $2,037,261 for the six months ended April 30, 1925. This comparison is made because of a change in the company's fiscal year from October 31 to December 31. Allowing for the eight months' dividend requirements on the first preferred, management and second preferred stocks the balance earned for common stock was $727,345, equivalent to 88 cents a share on the 825,244 shares of no par common outstanding. This compares with $1,371,987, or $1.69 a share, on 811,827 shares for the six months ended April 30, 1926, and $1,340,458 or $1.68 a share on 797,892 shares of common for the six months ended June 30, 1925.

Gross sales of $40,876,877 for the eight months ended June 30 1927, compare with $28,417,798 for the six months ended April 30, 1926, and $29,776,465 for the six months ended June 30, 1925. Between October 31, 1926, and June 30, 1927, the company bought in $1,185,000 of 5 per cent notes of 1931 and $1,080,000 of the 7 per cent first preferred stock.

The company states that the outlook for the coming three months is promising and that indications are for normal profits for the remainder of the year. Current sales and profits are running well ahead of the same period a year ago.

The B. F. Goodrich Co.

Net earnings of The B. F. Goodrich Co., Akron, Ohio, for the six months ended June 30, 1927, after deducting depreciation, interest on borrowed money and after making adequate provision for federal income taxes, amounted to $5,813,501. From these earnings there was set aside a reserve for general contingencies in the amount of $750,000. Inventory and commitments of principal raw materials are at cost which is substantially below market. The net sales for the same period were approximately $69,270,000.

The regular dividend of $1.75 per share was declared on the preferred stock, payable on October 1, 1927, to stockholders of record September 9, 1927.

A dividend of $1 per share was declared on the common stock without par value, payable on September 1, 1927, to stockholders of record August 10, 1927.

The Goodyear Tire & Rubber Co.

Net earnings of the Goodyear Tire & Rubber Co., Akron, Ohio, for the six months ended June 30, 1927, were $7,114,005, after charges and profits of subsidiaries applicable to stock not held by the parent company, but before dividends, as compared with $4,014,873 for the same period last year. Consolidated earnings were $10,519,454, after depreciation, inventories, Federal taxes, but before interest and other charges.

Net sales for the six months this year were $118,244,231, as against $116,788,924 for the first half of 1926. After deduction of extraordinary charges incident to refinancing, expenses and dividends paid, the balance of consolidated surplus as of June 30, 1927, was $24,408,283.

Lee Rubber & Tire Corp.

Net earnings of Lee Rubber & Tire Corp. and Republic Rubber Co., for the six months ending June 30, 1927, were $485,491.75. Net sales for the six months' period were $6,010,385.72. The company is in strong position as to inventories of raw materials. Crude rubber on hand and in manufactured goods is taken at current prices and there are no future rubber commitments at other than current market prices. There is an increasing demand for Lee products, the sale of tires for the six months ended June 30 showing a substantial increase over the corresponding period last year, and indications are for a good future business.

The United States Rubber Co.

Sales of the United States Rubber Co. for the six months ended June 30, 1927, amounted to $88,110,626, a decrease of $12,003,360 compared with the corresponding period of last year. This decrease was more than accounted for by an average reduction in selling prices of over 16 per cent.

There was a substantial increase in unit volume of sales of commodities other than tires, constituting about two-thirds of the total sales, which practically offset the reduction in selling prices of these commodities, averaging over 12 per cent.

Tire sales other than to automobile manufacturers increased in unit volume, which, however, was more than offset as to dollar volume by a decrease in selling prices of over 25 per cent. The decrease in total sales as stated above was due principally to a reduction of over 28 per cent in prices on tires sold to automobile manufacturers, and to a reduction in unit sales of tires to such manufacturers.

Net income, before interest on the funded indebtedness, but after all other charges, amounted to $6,392,651. Interest on the funded indebtedness amounted to $3,151,688, leaving net income of $3,240,963 after all charges. This does not include any income from rubber plantations. The business of the company, by reason of the nature of the commodities handled, is subject to seasonal conditions and is necessarily conducted and must be considered on a yearly basis. Therefore, the results for any period of less than a year are not conclusive. The reserve of $8,535,380, created at the close of last year, has been applied against inventories, and the results above stated were affected thereby to the extent applicable to the goods sold during the first six months of 1927.

The accumulated surplus of the plantations companies, amounting to approximately $9,000,000 as of December 31, 1926, is available to provide for any additional adjustment that may be found necessary for the year. The net profits of the plantations companies for the six months ended June 30, 1927, amounted to approximately $2,000,000. No part of the surplus of $9,000,000, or of the additional profits of $2,000,000 for the first six months of 1927, referred to above, has been included in the income or surplus of the United States Rubber Co.

Current assets as of June 30, 1927, amounted to $149,869,838, and current liabilities amounted to $38,176,450.

Current assets consisted of	
Cash	$8,146,433
Accounts receivable, less reserve for doubtful accounts	46,007,454
Total cash and receivables	$54,153,887
Inventories of finished goods and raw materials	95,715,951
Total current assets	$149,869,838
Current liabilities consisted of	
Bank loans	$17,550,000
Accounts payable, including acceptances payable for importation of crude rubber	20,626,450
Total current liabilities	$38,176,450

New York Stock Exchange Quotations

August 25, 1927

	High	Low	Last
Ajax Rubber, com	8⅛	8	8⅛
Fisk Rubber, com	16	15¾	16
Goodrich, B. F., Co. (4) com	69⅝	68½	68¾
Goodrich, B. F., Co. (7) pfd	104¾	104¼	104¼
Goodyear Tire & Rubber, com	53¼	52⅝	53
Intercontinental Rubber, com	13⅜	13⅛	13⅛
Kelly-Springfield Tire, com	23¼	22¾	23
Keystone Tire & Rubber, com	⅜	⅜	⅜
Lee Rubber & Tire, com	10½	10½	10½
Miller Rubber, com (2)	26¾	26¾	26¾
Norwalk Tire & Rubber, com	2½	2½	2½
United States Rubber, com	50⅛	48⅞	49¾
United States Rubber, 1st pfd. (8)	95¾	95	95¾

Akron Rubber Stock Quotations

August 23, 1927

Company	Bid	Asked
Akron Rubber Reclaim	....	37½
Akron Rubber Reclaim, pfd.	92	19
Falls	6	....
Faultless	37½	38
Firestone	146⅛	150
Firestone, 6 pct. pfd.	106½	107
Firestone, 7 pct. pfd.	104⅛	105
General	145	150
General, 7 pct. pfd.	102½	110½
Goodrich	68¾	69½
Goodrich, pfd.	103½	104½
Goodrich, 6½s	107	107½
Goodyear	53½	54⅜
Goodyear, prior pfd.	111	112
Goodyear, 1st Mtg. 8s	120	120½
Goodyear, 5s '28	93¾	94¼
India, com.	21	23
India, 7 pct. pfd.	....	92
Mason	1½	2¼
Mason, pfd.	15¾	16½
Miller	27½	28½
Miller, 8 pct. pfd.	98½	99½
Mohawk, 7 pct. pfd.	40	....
Seiberling	31	32
Seiberling, 8 pct. pfd.	101½	....
Star	½	2
Star, 8 pct. pfd.	....	25

New Incorporations

COLONIAL RUBBER CO., July 21 (New Jersey), capital $50,000. Louis Josephson, 23 Sanhican Drive; Anna Kramer, 345 Hillcrest avenue; George Hindley, R. F. D. Lawrenceville Road, all of Trenton, New Jersey. Principal office, Broad street Bank Building, Trenton, New Jersey. To deal in crude rubber.

EDISON BOTANIC RESEARCH CORPORATION, July 29 (New Jersey), capital $75,000. Charles Edison, West Orange; John V. Miller, South Orange; Ralph H. Allen, Orange, all in New Jersey. Principal office, Edison Laboratory, Main street and Lakeside avenue, West Orange, New Jersey. Experimental and research work relating to the production of rubber from rubber producing forms of vegetation.

ALLAN P. ISAACS, INC., July 22 (New York), capital $20,000. David Blum; Lillian Reiss; Lillian H. Messing, all of 1540 Broadway, New York City. Principal office, Manhattan, New York. To manufacture raincoats, rubbers, gloves, etc.

KEYSTONE RAINCOAT CO., INC., July 19 (Pennsylvania), capital $5,000. Samuel J. Horvitz, 1819 Murdock street; Joseph Rosenberg, 2312 Pittock street; Bernard J. Averbach, 1239 Shady avenue, all of Pittsburgh, Pennsylvania. To manufacture raincoats.

KRIEGER-SOHMER TIRE CORPORATION, July 5 (New York), capital $6,000. Elmer Krieger, 866 Noranaday Place; Harry Sohmer, 1025 Aldus street; Reuben Sturtz, 1289 Hoe avenue, all of New York City. Principal office, Bronx, New York. To manufacture tires.

LASTIC LACE CORPORATION, August 4 (New York), capital $200,000. Harry I. Goldstein; Louis A. Berko; Samuel Randel, all of 12 East 41st street, New York City. Principal office, Manhattan, New York. To manufacture elastics, etc.

MARTIN RUBBER CO., INC., August 19 (New York) capital $100,000. Dr. Martin Tepper, president and treasurer; Rosalin Tepper, secretary, both of 300 Riverside Drive; Alvin T. Sapinsley, director, 340 Madison avenue, all in New York City. Principal office, 327 Jackson avenue, Long Island City, New York. To manufacture mechanical rubber goods and dental specialties.

NEW CASTLE RUBBER CO., June 10 (Rhode Island), capital stock 100 shares of no par value. Philip Berman, 158 Tenth street; Frank W. Golemba, 75 Ontario street; Isadore S. Horenstein, 139 Dudley street, all of Providence, Rhode Island. To deal in tires and tubes.

OSWEGO TIRE SHOP INC., August 16 (New York), capital $10,000. Jacob and Martha Rudolph, both of 1651 Howard avenue, Utica; Lillian V. Cohen, 129 East 8th street, Oswego, both in New York. Principal office, Oswego, New York. To deal in tires, etc.

P. M. TIRE SERVICE, INC., July 13 (New Jersey), capital $125,000. Paul and Mike Koblanski, both of 50 Montrose Terrace, Irvington; Irving V. Levy, 181 Schuyler avenue, Newark, both in New Jersey. Principal office, 252 North Broad street, Elizabeth, New Jersey. To manufacture tires of all kinds.

SARRA & TUCKER SHOE CO., July 26 (Massachusetts), capital $20,000. Arthur I. Tucker, president, 225 Loring avenue, Salem; Frank Sarra, vice-president and treasurer, 13 Essex street, Lynn; John H. Mattson, clerk, 2 Winthrop avenue, Marblehead, all in Massachusetts. Principal office, Lynn, Massachusetts. To manufacture and deal in rubber goods.

A. SCHRADER'S SON, INC., July 19 (Delaware), capital stock 200 shares of no par value. Vern R. Foley, 414 West 121st street; George J. Kraft, 45 East 55th street, both in New York City; Talbot M. Malcolm, 321 Hyslip avenue, Westfield, New Jersey. Principal office with the Corporation Trust Co. of America, duPont Building, Wilmington, Delaware. To export.

SOFT STEP RUBBER HEEL CORPORATION, July 23 (New York), capital $25,000. Charles Di Sapio; John Santero, both of 301 East 39th street; G. Tamburello, 1475 Broadway, both in New York City. Principal office, Manhattan, New York. To manufacture rubber heels.

TRAVELITE RUBBER CO., INC. July 22 (Massachusetts), capital stock 1,000 shares of no par value. John J. Rooney, president and treasurer, 26 Lakeville Place, Jamaica Plain; Charles T. O'Conor, 251 Grant avenue, Newton; James W. Burke, 65 Hillside street, Boston, all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in rubber goods.

Electric Soft Metal Pot

Soft metal melting pots are common equipment in the mold casting shops of rubber factories where soft metal molds are used. Originally solid fuel was used as the source of heat. This was later displaced by gas for greater convenience, cleanliness, economy and better heat regulation. The practical importance of these

Pot for Rubber Mold Casting.

points has led to still further improvements in the method of heating soft metal for mold casting and lead encasing small hose by extrusion. Thus in the soft metal pot pictured in the Providence plant of the U. S. Rubber Co., the metal is electrically melted. Its capacity is five tons. Nine 5 kilowatt General Electric cast-in immersion units provide heat sufficient for melting one ton per hour of lead or tin. This kettle was formerly heated by fuel, but its conversion was easily and economically effected by the use of electrical units, and by placing extra insulation around the pot. A six-inch layer of powdered silocel around its sides and bottom make it thermally efficient. The temperature is automatically maintained within 2 degrees F. plus or minus. This pot is usually in service 24 hours daily.—*Electric Heat in Industry.*

"STEELEG" PLATFORM

Platforms and lift trucks are a most effective combination for easily and quickly moving stock and goods from place to place in a rubber plant. The basic idea has been worked out in many adaptations. In its simplest form it is a plank platform raised from the floor on wooden legs or skids. The boards of the deck are held vise-like between two steel angles running the full length of the platform, protecting the ends of the boards from splintering. The legs are of forged heavy bar steel of ample thickness for wear, and bolted to the angles or securely welded to them to insure rigidity if so desired.

Other platforms for rubber plant use are of all-steel construction in the form of special racks for supporting tires or tire cores, rolls of stock, etc. The type of lift truck built for these platforms is supplied in several models adapted to handle loads ranging up to 7,500 pounds by one man power.—Barrett-Cravens Co., 1328 West Monroe street, Chicago, Illinois.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	Com.	$1.50	Sept. 15	Sept. 1
Cambridge Rubber Co.	Com.	$0.25 q.	Aug. 1	July 25
Goodrich, The B. F., Co.	Com.	$1.00 q.	Sept. 1	Aug. 10
Goodrich, The B. F., Co.	Pfd.	$1.75 q.	Oct. 1	Sept. 9
Goodyear Tire & Rubber Co.	7% Pfd.	$1.75 q.	Oct. 1	Sept. 1
Hood Rubber Products Co.	Pfd.	1¾% q.	Sept. 1	Aug. 20
Miller Rubber Co.	Com.	$0.50 q.	Oct. 25	Oct. 3
Miller Rubber Co.	Pfd.	$2.00 q.	Sept. 1	Aug. 10

The Rubber Industry in America

Ohio

Production and sales of rubber manufacturing companies in Ohio during July and August indicate that the current quarter will equal if not surpass the high records established for the industry in the previous two quarters of the year. While there was a slight slowing up in tire sales early in August, demand from both dealers and automobile manufacturers has grown stronger, and there is every prospect for larger sales and earnings for the rubber companies during the remainder of the year.

Tire output of factories in the Akron district continues near the peak. More than 140,000 automobile casings and 160,000 inner tubes are being manufactured, besides large quantities of mechanical rubber goods, druggists' sundries and rubber footwear.

With few exceptions Ohio rubber factories are operating night and day employing three eight-hour shifts of workers. Employment conditions in Akron are satisfactory production having been so stable that approximately the same number of workers has been employed since about the first of the year.

Shipments of rubber footwear now are going forward at a good rate for the fall and winter trade, according to officials of the Goodrich and Firestone companies, two of the leading footwear producers in the country. Production is being increased at the Goodrich-Akron plant and at the Firestone-Apsley plant in Hudson, Massachusetts.

Several new features are being added to the Goodrich Zipper line of footwear this year. Based on orders booked so far, Zipper sales for the 1927-28 season will exceed all previous records, Goodrich officials state.

Automobile tire sales in July exceeded most expectations and all previous monthly records. August business continued at almost the same record breaking pace. With automobile manufacturers accelerating production and with the Ford plant resuming operation on a basis which will require about 4,000 tires a day, the additional original equipment requirements in prospect probably will more than make up for any sag in dealer demand during September. Preliminary figures show that shipments during the first six months of the year for the entire industry totaled more than 30,000,000 casings, against about 27,000,000 in the same period last year. Although unit prices of tires and other rubber products were lower than last year, dollar sales of some companies exceeded those of the first half of 1926.

Substantial recovery in earning power by rubber manufacturers, both large and small, is revealed in reports for the first half of 1927. Net profits in many instances approach the high earning figures reached in 1925. With the retail price situation apparently stabilized, earnings are likely to show further improvement for the balance of the year. The crude rubber market promises to continue firm, with the raw material available at fair prices.

General Tire & Rubber Co., Akron, Ohio, for the first half year reports a 49 per cent increase in dollar volume of sales over the corresponding period of 1926. The gain in unit volume of sales was 69 per cent. Net profits increased proportionately, it is stated. In 1926 General had total sales of $20,000,000, and net profits, before federal taxes of $709,831. Prospects are unusually good for a prosperous year for most rubber companies, according to President William O'Neil.

Akron Progress

Statistics of production give the reason why Akron is looming so large as an industrial city in the nation's news, says the Akron Beacon Journal. Akron now ranks tenth in the value of its manufactures. When it is considered that Akron is led for tenth place only by cities of much larger population, the production figures are more than creditable to this community. Here is the table of the rank and output of America's ten cities first named in the report:

New York City	$5,324,413,612
Chicago	3,439,163,391
Philadelphia	1,937,414,991
Detroit	1,599,340,838
Cleveland	1,094,779,556
St. Louis	874,557,373
Baltimore	678,928,541
Buffalo	675,435,651
Boston	582,651,213
Akron	565,391,322

Citizens who are trying to merge Akron, Kenmore, Barberton and Cuyahoga Falls into a Greater Akron district should be encouraged by this showing. It is not beyond expectation that within a few years Akron may make its way into the class of cities whose products are valued at a billion.

Miller Rubber Co., Akron, Ohio, reports for the first half year net earnings of $560,000 after all charges except federal taxes. The showing was not quite as good as had been expected, but officials say the last half year undoubtedly will be much more profitable.

India Tire & Rubber Co., Akron, Ohio, experienced a gain in sales of 47 per cent in the first six months of 1927 over the same period last year, officials announce. Net earnings more than covered dividend requirements for the entire year.

Firestone Tire & Rubber Co. officials, W. D. Hines, Ross Wilson, Albert Holcomb, and Warren Brockett, recently returned to Akron from a business trip to the Firestone rubber plantation holdings in Liberia. They announced that 12,000 Liberian natives now are at work there for the plantation subsidiary, under the direction of 110 white men. Feeling throughout the country is friendly toward the enterprise, they stated.

Seiberling Rubber Co.'s employes and their families attended the company's annual picnic August 22 at Meyer's Lake Park, near Canton, Ohio. It was the biggest outing of the kind ever held, according to E. R. Gibson, general chairman. Hundreds of employes drove their cars in a parade which left Barberton at 8 a. m. Special interurban cars carried others from Akron and Wadsworth. Special events and entertainment stunts were staged, including a baseball game between the Seiberling Supremes, of Toronto, Canada, girl champions of the world, and the Flemings Furniture Co., of Cleveland. Motion pictures of the activities were made by G. R. Carrier, Seiberling motion picture director.

Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, entertained more than 600 Ohio cattle breeders at the Harbel Manor estate near Akron, August 17, in connection with the Tri-County Guernsey Breeders Association annual field day. Mr. and Mrs. Firestone served luncheon to the guests under a large tree on the lawn.

Goodrich Rewards Sales Leadership

Goodrich star salesmen in the druggists' sundries trade from all sections of the country were in Akron August 15 as guests of the company. The trip and entertainment were offered as a reward for sales leadership during the past year. About fifty were in the party. A dinner was held in the evening at Riehl's Inn, Turkeyfoot Lake, at which special prizes were presented. Motion pictures of the rubber plantation industry, recently produced for Goodrich by Captain Barnett Harris, U. S. S. C., in Sumatra, were shown. Talks were given by W. O. Rutherford, vice president in charge of sales; L. A. McQueen, advertising director, Harry Baker, sales training manager, and Herman Haas, crude rubber division. R. C. Musson of the M. F. Murdock Co., Akron, was one of the district leaders participating.

A. C. Bowers, factory manager of the Mason Tire & Rubber Co., Akron, Ohio, has been appointed a member of the board of directors.

B. J. Brooks, credit manager of the Mohawk Rubber Co., Akron, Ohio, has been placed in charge of the repair material and accessory sales department. D. W. Harley will assist Mr. Brooks in the sales department.

Swinehart Tire & Rubber Co., Akron, Ohio, held its 18th annual picnic for factory and office employes August 11 at Chippewa Lake, near Akron, the entire plant being closed for the day. On the picnic committee were: C. J. Walsh, chairman, Miss B. Delaney, Mrs. Irons, Paul Johnson, Warren Kellogg, and Harold Reiker. There was a baseball game, field events, and refreshments, furnished by the company.

The B. F. Goodrich Co., Akron, Ohio, which made an amazing recovery in the first half of 1927, may pay an extra dividend to stockholders before the end of this year, according to reports in Akron rubber circles. While the management has always been conservative, it is believed that a more liberal dividend policy would be inaugurated if earnings in the last half are equal to those reported in the first six months. Prospects are that the company will do even better in this period, during which sales of rubber footwear will be a big item. Work is being rushed on the new $4,000,000 tire manufacturing plant being built in Los Angeles, California. Plans are also underway for enlarging the British-Goodrich subsidiary in England.

The Akron Rubber Mold & Machine Co., Akron, Ohio, has just announced the appointment of James W. Brundage as rubber development engineer. The

J. W. Brundage

company's desire to increase the facilities and service of its rubber development department was the cause of retaining Mr. Brundage.

Miles Tire & Rubber Co. has increased production at its Hartville, Ohio, factory to 1,000 tires a day, according to H. S. Bibbins, sales manager. The company confines its operations to low priced tires.

The Grubb Rubber Co., Wadsworth, Ohio, reports rapidly increasing sales demand. Wide interest in the company's 30 by 3½ and 29 by 4.40 size tires has been shown by dealers and distributers, according to H. C. Allyn, sales manager. The company also produces men's rubber belts, rubber mats, tubing for vehicle wheels and tire repair materials.

Rubber Chemist Enters New Field

Dr. W. J. Kelly has resigned his position with the Goodyear Tire & Rubber Co., Akron, Ohio, to accept a position with Rohm & Haas Co., Philadelphia dealers in synthetic and paint resins, and similar materials. Dr. Kelly will have charge of sales promotion and development with the new company which does not handle supplies for the rubber industry.

A former secretary of the Akron section of the Rubber Division, American Chemical Society, Dr. Kelly read a paper before that section in 1920 entitled "Determination of True Free Sulphur and the True Coefficient of Vulcanization in Vulcanized Rubber." This paper received a wide circulation, and was followed by a second discussion on the same subject in 1922.

Rubber Service Buys Southern Dyestuffs Co.

The Southern Dyestuffs Co., Nitro, West Virginia, has sold its entire assets to C. O. North, secretary and treasurer of the Rubber Service Laboratories Co., as trustee for the Elko Chemical Co., which will be organized soon. The Southern Dyestuffs Co. is a large manufacturer of carbolic acid, and derivative products, the manufacture of which will be continued. The properties of both companies adjoin at Nitro, with an approximate plant area of thirty acres.

The Rubber Service Laboratories Co., in addition to its Nitro factory, has a very extensive rubber laboratory and sales office at Akron, Ohio. The officers of the company are: Carl N. Hand, Nitro, West Virginia, president; E. J. Small, Jr., Akron, Ohio, vice president; and C. O. North, Akron, Ohio, secretary and treasurer.

Aetna Rubber Co. officials are considering plans for building a new plant, either in Cleveland or Ashtabula, to provide additional capacity for the manufacture of dipped rubber gloves. President S. T. Campbell states the expansion will enable the company to expedite shipments and operate more economically. Net earnings, after all charges, for the half year ended June 30 totaled $115,000, compared with $90,000 in the same period last year. Profits in the first six months of 1927 were equal to $1.50 a share on 70,000 shares of common stock, after paying preferred dividends. Contributing largely to this favorable showing were contracts that Aetna acquired for electric refrigeration parts.

Otto A Friedrich, of Germany, who has been in the United States for several months studying the rubber industry, has been appointed special representative of The B. F. Goodrich Co. in that country.

Eclat Rubber Co., a $200,000 concern with plants in Kent and Cuyahoga Falls, Ohio, is being operated under the management of Ross and E. H. Trump, founders of the Trump Rubber Co. Controlling interest was acquired recently from W. H. Stillwell, former president of Eclat. E. H. Trump is president of the new company, and Ross Trump, secretary. W. A. Heffelman and C. A. Reiss remain as vice president and assistant secretary, respectively. They, with S. W. Sweet, comprise the board of directors.

Aviator Carries Instructions and Tires to Lindbergh

Lieutenant John F. Campbell, of the United States Air Reserve, Dayton tire distributer in Cincinnati, Ohio, arrived in Dayton via the air Friday noon, August 5, landing at McCook Field with an official message to Colonel Charles E. Lindbergh from Major E. L. Hoffman, Commanding Officer at Lunken Airport, Cincinnati, where Colonel Lindbergh was scheduled to arrive the following afternoon. The special message concerned conditions at Lunken Airport and included landing instructions for the world famous aviator.

In returning to Cincinnati, Lieutenant Campbell carried two spare Dayton airplane tires in the event that Colonel Lindbergh's tires should need replacement.

Lieutenant John F. Campbell

Lieutenant Campbell is proprietor of The Campbell Tire Service Co., with two stores at Cincinnati, one located at 2514 Reading Road, and the other at 2016 Madison Road and Cinnamon street.

Elastic Industry Merger

The directors of Glendale Elastic Fabrics Co., George S. Colton Elastic Web Co. and Easthampton Rubber Thread Co., all of Easthampton, Massachusetts, have approved a plan for the exchange of the stock of their respective companies for stock in United Elastic Corporation. In addition to the above, the directors of Conant, Houghton & Co., Littleton and Lowell, Massachusetts, have also approved a plan for the sale of the bulk of their assets and those of their affiliated Littleton Manufacturing Co. for stock in the United company.

The Easthampton Rubber Thread Co. which manufactures the rubber thread used by the other three companies will continue to be operated as a separate company.

Massachusetts

The quickening of activity in the rubber trade which is always felt after the summer shutdown period in the footwear industry with the approach of fall, has manifested itself earlier than usual, and full schedule operations are general throughout the trade here. The new styles in overshoes are selling beyond expectations, and the continued wet weather during the summer months has alleviated an ordinarily dull period for boots and light rubbers to some extent. The heel and sole trade is experiencing a distinct revival owing to the high leather prices, and this is expected to boost the sale of tennis shoes which compete with low priced leather shoes in many markets.

The United States Rubber Co. surprised the footwear trade by issuing its tennis catalog with prices for 1928 on August 1 instead of on September 1, which is the custom. Prices are unchanged from a year ago when they were reduced, and the line shows a novelty trend doubtless influenced by the fancy gaiter craze.

The Converse Rubber Shoe Co., Malden, Massachusetts, went on full time the week of August 15 when the Saturday morning shift was added. Production is sold ahead until November 1 and the outlook is the best in years. Frederick N. Hammerstrom, export sales manager, formerly vice president of the Essex Rubber Co., has resigned.

The Hood Rubber Co., Watertown, Massachusetts, reports several personnel changes. R. A. Blanchard, formerly factory manager of the State rubber department, is now factory manager of tires, tubes, hard rubber, heels, and soles. P. F. Leland succeeds him in his former position. C. W. Johnson, factory manager of footwear production, now has charge of both production and technical service, in a consolidation of these endeavors. N. E. Tousley, technical manager, joins A. W. Glidden in the research, development, and laboratory division. C. H. Roper, general superintendent, now reports direct to Frederic C. Hood, president and treasurer. Current footwear production is 70,000 pairs daily, and the tire and mechanical divisions are running full time.

George H. Rockwell, vice president of the Cambridge Rubber Co., Cambridge, Massachusetts, was one of the first to congratulate in the press, Governor Fuller on his decision in the famous Sacco-Vanzetti case.

B. W. Whittier, formerly employment and planning manager at the Converse Rubber Shoe Co., Malden, Massachusetts, has joined the Phillips-Baker Rubber Co., Providence, Rhode Island, in charge of the making departments. Production is in excess of 6,000 pair daily which has broken all previous records for the plant. The company's offices have been moved to a separate building to make room for more productive space.

The Boston Rubber Shoe Co., Malden, Massachusetts, United States Rubber Co.'s footwear subsidiary, resumed production on August 15 after a two weeks' shutdown. The mill is now on full time with a schedule of 30,000 pairs daily.

Goodyear Rubber Co.'s main office will be moved from New York to Middletown, Connecticut, where distribution for New England and the East will be handled. F. E. Church, formerly with the United States Rubber Co., reports that the Middletown mill is on full time. It is also reported that the Lambertville Rubber Co.'s plant at Lambertville, New Jersey, operating under the same management, will be closed and operations consolidated at the Middletown plant.

The Firestone Tire & Rubber Co.'s new sales and service station will be located at Brookline avenue and Fullerton street, Boston. The contract has been awarded to Stone & Webster, Inc., and work will start immediately on a building of three stories to be constructed of brick and limestone.

The Firestone Footwear Co.'s mill at Hudson, Massachusetts, resumed operations August 1 after a week's shutdown and is now on full time.

Reclaimers are running full time with exceptional demand for tire and tube stocks. Scrap is in strong hands and many dealers are reluctant to sell with the result that prices are firmer.

Claim Commission for Salmon Falls Mills Sale

A commission of $40,000 is claimed by Harry and William W. Edelstone, Portland, Maine, for the sale for $500,000 of the plant of the Salmon Falls Manufacturing Co., Rollinsford, New Hampshire, to the New England Public Service Co.

The plaintiffs claim to have obtained the New England company as purchaser and allege a five per cent commission is due them. Completion of the transaction is held up pending the outcome of the suit, which has been brought in the Strafford County Superior Court against the Salmon Falls Co.

New Jersey

Rubber production in the New Jersey plants continues good with the exception of the hard rubber division. Plants manufacturing tires and mechanical goods report capacity production and some plants are operating overtime. There is a fair demand for rubber articles which are used in the automotive industry. Production of heels and soles also continues good. The hard rubber industry does not show any improvement and manufacturers believe that conditions are due to overproduction and importation of goods from Europe.

The United & Globe Rubber Co.'s affairs have been wound up by Federal Judge William N. Runyon in the United States District Court, with the approval of the report and the award of receivers' fees amounting to $38,950. According to the report receipts of the concern since it went into receivership about three and a half years ago were $193,340, and disbursements, $1,820. The sum of $191,519 remained to satisfy the claims of creditors amounting to $720,294. It is expected that this will be paid out within a short time after which the court will approve the final accounting. Included in the fees awarded are $17,000 to Bilder & Bilder, Newark lawyers, for acting as attorneys for the receivers, and $10,000 each to the two receivers, Colonel Edward C. Rose, of Trenton, and J. Philip Bird, of Plainfield, both in New Jersey.

The Ajax Rubber Co.'s plant at Trenton, New Jersey, will not be opened soon. The big plant employed more than 1,000 tire and tube makers. There were rumors that the factory was to be moved to Racine, Wisconsin, but this was denied by the company. The Ajax company has a large stock in its warehouses at Trenton and is keeping its sales department open to supply the trade. The company recently announced that it was building a large addition to the Racine plant.

Israel H. Albert, has brought suit in the Court of Chancery at Trenton, New Jersey, to compel an accounting by Michael Gilinsky, Abe and Hyman Rosenthal, Milton Mirkin and Benjamin Goldman of the profit said to have been derived from the purchase and resale of the plant of the bankrupt Spartan Rubber Co., Yardville, New Jersey. Albert claims that he entered into an agreement with the defendants whereby each was to contribute one-sixth of $40,250 as a bid for the plant and share in the profits. Subsequently the plant was sold to the Fisk Flap Tube Rubber Co. for about $60,000.

Fineburg's Auto Tire & Accessory Co., Trenton, New Jersey, has been awarded the contract to furnish the State of New Jersey with solid tires. The contract price was $7,743. Action was deferred by the State House Commission on bids ranging from $47,000 to $57,000 for furnishing pneumatic tires for the fleet of State-owned automobiles.

Israel Richmond, owner of Richmond's Tire Shop, Trenton, New Jersey, has given up the agency of Miller tires and tubes after many years and is now handling the Fisk products.

Whitehead Brothers Rubber Co., Trenton, New Jersey, continues busy in all departments and expects to run two shifts until far into the fall months.

Edgar H. Wilson, formerly one of the owners of the Dural Rubber Co., Flemington, New Jersey, has announced that he will be a candidate for election as a delegate to the Republican National Convention next year. He was a candidate for the New Jersey State Senate a few years ago.

The A. & G. Lacking Co., of Newark, New Jersey, has leased a large building at 400 Southard street, Trenton, New Jersey, and will engage in the manufacture of rubber novelties. The building is of two story brick and contains 6,000 feet of floor space. The new company will make a number of improvements to the building and begin operations in a short time.

The Dural Rubber Co., Flemington, New Jersey, is very busy at the present time and is now using part of another plant for its packing and inspection departments. The company manufactures auto tubes, linings for milking machines, auto radiator hose connections, grip handles for airplane stocks, chafing disks for aircraft, bath sponges, and solid rubber balls for universal joints. The company is working on an order for a quarter of a million of rubber balls for universal joints for cars. William C. Ehrenfeld is president and manager of the concern.

The Thermoid Rubber Co., Trenton, New Jersey, reports that business in all departments continues good. The company had a very busy summer season.

The Raymond Rubber Co., Titusville, New Jersey, closed its plant several weeks ago and it is not known when the factory will be opened again. The concern carries on a reclaiming business exclusively.

The Pocono Rubber Cloth Co., Trenton, New Jersey, continues to operate to capacity at both of its plants.

The Vulcanized Rubber Co., Morrisville, Pennsylvania, reports that business is poor at the present time in all lines of hard rubber goods. The company has been operating at short hours since early summer. An official of the concern said that he expected business to pick up in the early fall. He blames business conditions on overproduction.

C. Francis Fisk, president of the Fisk Flap Tube Rubber Co., Yardville, New Jersey, is reported slightly improved. He was taken ill about two months ago and is still confined to his home.

The Murray Rubber Co., Trenton, New Jersey, announces that business is good in all departments. The tire and tube departments and the mechanical goods rooms are operating overtime. The tire production has increased over last month. The company expects a busy fall season.

Governor A. Harry Moore, of New Jersey, and the budget officers are considering the feasibility of installing a tire rebuilding and repair industry in the New Jersey State Prison or Rahway Reformatory. The purpose is to teach the inmates a trade and to reduce expenditures. Last year the state spent more than $50,000 for tires.

The Raymond Rubber Co., Titusville, New Jersey, suffered a loss recently when several large piles of reclaimed rubber were destroyed by fire.

Joseph S. Papier, proprietor of Joe's Tire Shop, has leased the property at 703 South Broad street, Trenton, New Jersey, and is now occupying the place as a tire and radio shop. Mr. Papier now has five tire stores in Trenton.

The United Tire Stores Co., Trenton, New Jersey, has leased a store at 114 South Warren street for a term of years and will use it as a branch establishment.

Horace B. Tobin, president of the Woven Steel Hose & Rubber Co., Trenton, New Jersey, with his family recently sailed for Europe. The Tobins will motor through several of the foreign countries.

Robert J. Stokes, president of the Thermoid Rubber Co., Trenton, New Jersey, left early in August for an extended trip through the countries of South America. Mr. Stokes, who is accompanied by his family, will remain away for two months.

The Empire Tire & Rubber Corp., Trenton, New Jersey, reports that prices are on the downward trend, and stocks are small. The company is operating at about 60 per cent capacity.

Jenkins Bros.'s rubber division is making extensive alterations to the Elizabeth plant. New heavy duty 72-inch mills driven by synchronous motor are replacing smaller units and all machines are being equipped with individual motor drive. A new addition to the building has been erected to house the electrical generating equipment. The company manufactures valve disks, sheet packing and special connectors for railway car heating systems. W. T. Easley is factory manager.

Raritan Rubber Co., New Brunswick, New Jersey, manufacturer of solid tires exclusively, reports business as being very good with the plant running about to capacity. The officers are: Alfred Foster, president; William Dudde, treasurer; Russell Watson, secretary; and Max Kahn, technical director.

Fred Eckrode and associates have purchased the plant formerly occupied by the Aetna Tire & Rubber Co., New Brunswick, New Jersey, and are manufacturing a line of rubber bumpers, shock absorbers and universal joints for automobiles.

Whitall Tatum Co., Keyport, New Jersey, manufacturer of molded articles and druggists' sundries, has just closed a very successful season on a new type of molded bathing cap. Robert Rothwell is factory superintendent.

Northeastern Rubber Co., manufacturer of flaps, is now located in the new factory on East Grand street, Elizabeth, New Jersey. In addition to the regular line, the company is manufacturing flaps for clincher and drop center rims. Gustave Degenring is in charge of manufacturing.

The Phelps Tire Co., Garfield, New Jersey, is averaging a daily output of 1,300 tires and reports plenty of new business in sight. Harry E. Phelps is president and Walter H. Grote factory manager.

Michelin Tire Co., Milltown, New Jersey, announces that the school which the company has established for the children of its French employes, will be opened September 12 and will be in charge of Mrs. Andre Bonissol.

The Overman Cushion Tire Co., Belleville, New Jersey, has completed and put in operation the initial installation of equipment for manufacturing pneumatic tires. The company will make only truck and bus sizes to supplement its line of solid tires. George Nelson is factory superintendent.

Joseph Kudrnac & Co., Nachod, Czechoslovakia, manufacturer of hose and other mechanical rubber goods, is planning to install equipment for the manufacture of about 100 tires per day. The company's representatives, Zdenek Kudrnac and Emil Celbs, have headquarters at 28 West Kinney street, Newark, New Jersey.

Colvin & Servis, Rahway, New Jersey, report business as being excellent, it being necessary to operate at night during the past month to fill orders. The company rebuilds tires and manufactures repair materials. A. R. Colvin is general manager.

John Royle & Sons, Paterson, and **Carrier Engineering Corp.**, Newark, New Jersey, are among the exhibitors to the Fourth Educational Graphic Arts Exposition to be held September 5-17, 1927, at Grand Central Palace, New York, N. Y.

Thermoid Brake Lining Suit

Judge Joseph L. Bodine in the United States District Court, Trenton, New Jersey, has dismissed the suit of Wright & Corson, of Bridgeport, Connecticut, and Philadelphia, Pennsylvania, against the Thermoid Rubber Co. for alleged infringement of patents on auto brake lining machines. The court said it could find no infringement on the part of the Trenton firm. The Thermoid company was charged with infringing and entering into an agreement with other manufacturers to defy patents on brake relining machines and a device for drilling and applying brake linings. The complainant also sought an accounting of profits and the award of three times the amount of damages alleged to have been sustained by reason of the Thermoid company's sale of the alleged patented devices.

Farrel Birmingham Proposed Merger

Notices have been received by the stockholders of the Farrel Foundry & Machine Co., Ansonia, Connecticut, and Buffalo, New York, and the Birmingham Iron Foundry, Derby, Connecticut, that the directors of these two companies have recommended that the companies be merged into a new company, to be known as the Farrel Birmingham Machinery Corp. A meeting of the stockholders has been called for September 20 to take action on this matter.

The officials of these two companies believe that such an amalgamation will make possible greater and more satisfactory service by having a greater flexibility in plant and plant equipment to assure uniform and prompt deliveries. Also the combining of the engineering research and development talent will effect a material economic saving.

It is understood that no radical changes are contemplated and that the new company will be managed by the same active managers who are at present operating the two companies.

New York

Goodyear Sundries & Mechanical Co., Inc., announced that after August 15, the company will be located at 116 Chambers street, New York, N. Y.

J. P. Sullivan, former secretary and general manager of the Rubber Trade Association of New York, is now a broker in crude rubber futures on The Rubber Exchange of New York, Inc., 31 S. William street, New York, N. Y.

Newman Bros. well-known tire distributers with offices in the General Motors Building, 1775 Broadway, New York, N. Y., have acquired the United States manufacturing and sales rights for the Aviator airplane tire, and the Prismotor motorcycle tire, both of which are German inventions.

Arthur W. Stedman, well known in the crude rubber trade, is now associated with the crude rubber department of Isaac Winkler & Brother Co., 50 Broad street, New York, N. Y.

William B. Wiegand, well-known rubber chemist, sailed from New York August 26, 1927, on the *S. S. Olympia* for a brief business trip to England and the Continent. While abroad he may be reached by mail or wire at 110 Cannon street, London, E. C., England.

The Gryphon Rubber & Tire Corp., Bailey avenue and 192nd street, New York, N. Y., has placed on the market all the equipment of its modern tire plant. Full list and prices will be given on request.

Organizer of U. S. Rubber Co. Weds at 77

Charles R. Flint, one of the organizers of the United States Rubber Co., was married to Miss Charlotte Reeves, of Washington, D. C., on the afternoon of July 28, at the First Presbyterian Church, New York, N. Y. The couple left for Europe, where Mr. Flint will negotiate industrial consolidations, and on their return will reside in New York City. Mr. Flint is a member of the Century, Metropolitan, New York Yacht, Bankers and Midday Clubs, and is the author of "Memories of an Active Life."

International Acceptance Bank Arranges Credit

A credit of $30,000,000 has been placed at the disposal of the Golddiskontbank of Germany by a group of New York bankers headed by the International Acceptance Bank, Inc. The credit, which was arranged during the recent visit of Dr. Hjalmar Schacht, president of the Reichsbank, will run for an initial period of a year and be renewable after that time.

Pennsylvania

Joseph W. Weaver, Lebanon, Pennsylvania, has just closed a very successful season marketing the Weaver health play ball. E. W. Zechman is factory superintendent.

The Hydro-United Tire plant at Pottstown, Pennsylvania, is now being operated by Dickinson Tires, Inc. Production of tires under the patented process of Fred S. Dickinson is being rapidly increased to include all sizes of balloons and high pressure cords. E. Gray Webber is factory superintendent.

Traveler Rubber Co., Bethlehem, Pennsylvania, is working on a plan for refinancing and it is hoped that the factory will shortly resume the manufacture of tires and tubes. Howard Lehman, Bethlehem Trust Building, is receiver.

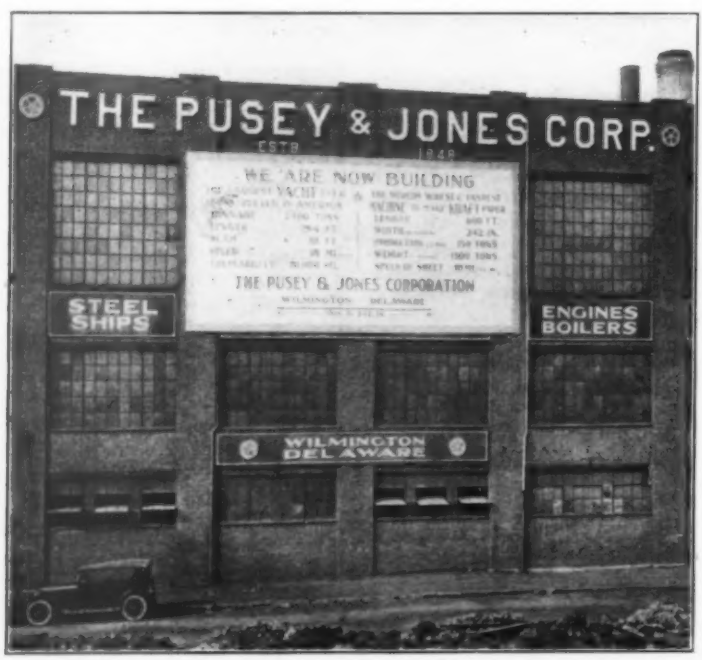
E. G. Scharer has succeeded Carl L. Reed as Pittsburgh branch manager for the Miller Rubber Co., Akron, Ohio. Mr. Reed is entering the automotive export business.

Johnson & Gallagher, importers and exporters of crude rubber, have announced the removal of their offices from 139 South Third street to 209 South Third street, Philadelphia, Pennsylvania.

R. R. Huber, formerly chemist of The Mason Tire & Rubber Co., Kent, Ohio, has accepted the position of chemist of The Pennsylvania Rubber Co., Jeannette, Pennsylvania.

The Lee Rubber & Tire Corp., Conshohocken, Pennsylvania, held a meeting of its board of directors in New York, July 28, and elected W. W. Benner, who joined the organization in 1926, vice president of the corporation in charge of manufacturing. This promotion of Mr. Benner's comes as a reward for the splendid work he has done in the Conshohocken plant, and he will continue his office there.

W. W. Benner



The world's biggest and fastest Kraft paper machine and the world's biggest yacht. . . . And the Pusey & Jones Corp. have billboarded the place to tell the world that travels through Wilmington, Delaware, all about it.

Southern

The Cooper Tire & Battery Co., Spring and Simpson streets, Atlanta, Georgia, is considered one of the most complete automotive services in the south. This company distributes Cooper tires and batteries, accessories as well as radio. T. L. Matthews is manager.

The Goodyear Tire & Rubber Co. has just moved into its new branch building at 306-8 South Franklin street, Tampa, Florida. The building is 100 by 100 feet, two stories high, with 20,000 square feet of floor space for display and storage purposes. According to C. W. Davis, branch manager at Jacksonville, under whose direction the Tampa office comes, enlarged quarters have been greatly needed for some time due to the growth of Goodyear business.

T. H. White, former Goodrich representative in the Houston territory, is now sales representative of the Seiberling Rubber Co. in Amarillo, Texas.

W. G. Hand has been appointed sales representative for The Norwalk Tire & Rubber Co., Norwalk, Connecticut, his territory to include South Carolina, Georgia and a part of North Carolina, with headquarters at Atlanta. Mr. Hand has been associated with the Dayton Rubber Co. for the past few years and is well acquainted in the South.

E. B. Digby will cover Alabama and Tennessee for the Norwalk company, with headquarters in Birmingham. Mr. Digby has had many years' experience in the tire business.

The Electric Hose & Rubber Co., Twelfth and Dure streets, Wilmington, Delaware, contemplates purchasing a number of triplex power pumps, Rumsey type, suitable for rebuilding for special requirements.

A. Thalmann, Cooper Tire & Battery dealer in Nashville, Tennessee, has recently established one of the most modern and up-to-date service stations in that city. Complete tire, battery and repair service is offered.

United Tire Stores, Dallas, Texas, has opened a new store in Oklahoma City to take care of the Oklahoma territory, and one in Houston covering distribution for southern Texas.

The Firestone Footwear Co.'s southern and western sales manager, Andrew P. Foss, has moved his headquarters from the Boston branch to Philadelphia, Pennsylvania, where the company is opening a branch warehouse, in line with the policy recently announced to sell direct to the retailer instead of through the jobber.

Rhode Island

Rhode Island made a good showing in exports during 1926, as the value of products shipped to foreign countries aggregated $15,514,152. This export business did not include parcel post shipments which relate to rubber surgical, toilet and domestic articles.

A good showing was made by the manufacturers of rubber, the Rhode Island plants having shipped out rubber thread valued at $1,606,262 and rubber footwear worth $1,433,902, an aggregate of $3,040,164.

If the large rubber plants would make shipments for export direct from Providence, the state would be credited with an immense volume of manufactured rubber exports to foreign points. The Woonsocket Rubber Co. is turning out great quantities of footwear in its two plants, the Woonsocket and Manville factories; the National India Rubber Co. of Bristol is shipping much footwear and insulated wire; while the United States Rubber Co.'s plant in Providence is shipping abroad immense quantities of rubber thread, golf balls, bathing caps and balloons from other ports of export. Hence the $515,471 of rubber exports credited to Rhode Island for the first quarter of this year are but as drops in a bucket compared to the big volume of rubber export business which the state should rightfully enjoy.

There was considerable falling off in the volume of rubber goods exported from Rhode Island during the first quarter of the present year, as compared with the corresponding period of last year. From January 1 to March 31, 1927, Rhode Island's exports were valued at $515,471 of which footwear was valued $248,457 and rubber thread $307,014. These figures do not include shipments made through parcel post of surgical, medicinal, toilet and other rubber articles by the Davol Rubber Co. of Providence, one of the largest manufacturers of rubber sundries in the United States.

The Davol Rubber Co. is reputed as exporting 85 per cent of all rubber goods that are sold in Porto Rico. It has fine markets in the Philippines, Japan, China and Sweden, and in the South American markets it is successfully meeting German competition in its lines because of the superiority of its goods. It is doing a good export business in England and France, and is reaching out for more business in those countries.

The American Electrical Works, Philipsdale, East Providence, Rhode Island, has started work upon the extensive plant additions and improvements to cost approximately $250,000. At present an addition is being made to the machine shop, while a new one-story garage is being built.

The Fisk Rubber Co. is overhauling and improving its Ninigret Mill on Front street, Pawtucket, at an estimated cost of $15,000.

Edward A. Currier, Jr., Industrial Relations Manager at the factory of the National India Rubber Co., Bristol, Rhode Island, who recently underwent an operation at the Jane Brown Hospital, is recuperating in northern Vermont.

John E. Canning, attorney, 1026 Grosvenor Building, Providence, has been registered at the office of the Secretary of State in accordance with Rhode Island laws as the legal representative in this state of The B. F. Goodrich Co., Detroit, and the Diamond Rubber Co., Inc., New York, N. Y.

Henry Otte, formerly treasurer of the Fisk Rubber Co.'s Ninigret division, has been appointed secretary-treasurer of the recently formed New England Yarn Spinners' Association, and has entered upon his new duties. Headquarters for the new association have been established at Providence.

Midwest

Yarnall-Waring Co., Chestnut Hill, Philadelphia P,ennsylvania, announces the opening of a new office at 314 Wright Building, Tulsa, Oklahoma, in charge of Caleb L. Horne, district manager.

The Falk Corp., Milwaukee, Wisconsin, manufacturer of herringbone gears, speed reducers, flexible couplings, oil engines and steel castings, announces the opening of an office in Portland, Oregon, at 720 Terminal Sales Building, 12th and Morrison streets. This office will be in charge of John Jurgensen, who has been in the company's New York office for seven years.

Ray R. McClure, until recently chemist of The Pennsylvania Rubber Co., Jeannette, Pennsylvania, is now in charge of the chemical department of the Century Rubber Co., Chicago, Illinois.

Wire and Cable Companies Merge

The merger of the Illinois Wire & Cable Co., 111 West Washington street, and the Chicago Insulated Wire & Manufacturing Co., 53 West Jackson Boulevard, Chicago, Illinois, has been announced, the new company to be known as the Inland Wire & Cable Co., with main plant at Sycamore, Illinois, and to have a capitalization of $2,000,000. Both plants will continue as formerly, and it is reported, negotiations will soon be concluded for the acquisition of a third company. A. B. Gochenor, former president of the Chicago Insulated Co., will be president of the new organization and George E. Dutton, former president of the Illinois Wire Co., will be chairman of the board.

The Marathon Rubber Products, Inc., Wausau, Wisconsin, has just completed a new building of 3,000 square feet to accommodate additional rubberizing machinery and provide for needed garment manufacturing space and shipping facilities.

The Judsen Rubber Works, 4101-4111 West Kinzie street, Chicago, Illinois, manufacturer of a general line of molded goods, has added considerably to equipment and enlarged the old buildings 100 per cent. The company looks forward to an increase in business this fall. Carl Judsen, Jr., is superintendent.

J. C. Brown has recently joined the sales force of The Norwalk Tire & Rubber Co., Norwalk, Connecticut, and will cover the state of Indiana. Mr. Brown has been connected with the Dayton Rubber Manufacturing Co. for some time, representing that company in Michigan.

Steinbrenner Rubber Co.

Although an order has been issued for the sale of the plant and equipment of the Steinbrenner Rubber Co., Noblesville, Indiana, no date or time limit has been set for carrying out this order, which is really a permit to sell should a buyer become interested. At the same time the court order was issued a new contract was signed for an additional 200 tires per day, permitting the company to operate on a much better basis than in the past and indicating continued operations.

The plant has been in operation under receivership the past year with the entire production sold to one selling agent, which arrangement has now been changed and a sales force organized to sell direct to dealers.

Pacific Coast

A marked increase in tire selling on the installment plan has been one of the developments of the rubber industry on the Pacific Coast, and the few small concerns that a year or so ago timidly ventured into this field now find that they must compete with several large, well-financed companies specializing in credit tire sales and whose success is indicated in the opening of steadily expanding chains of stores throughout the whole coast field.

First payments of one-fifth or one-fourth the price are required, buyers then give a chattel lien, and, paying interest at the rate of one per cent a month, clear up an account in from four to six months. Credit merchants say that a price rise would give their sales considerable momentum, and probably slow up sales of regular tire dealers. Many of the latter, to combat the "gyps," are using second line tires with much success, so that total sales are generally reported well above last summer's average.

Demand for mechanical rubber goods generally continues good. Building operations are considerable and there is a good sale for general contractors' belting, heavy-duty hose, etc. There is some complaint about price-cutting on staple rubber goods, and cases are instanced where, instead of cash rebates being offered as inducements to buyers, the latter get considerable merchandise on which billing is indefinitely deferred.

Pioneer Rubber Mills, San Francisco, California, continues to operate at high pressure on night and day shifts. Additions are being made steadily to equipment and plans completed for further extensions to the plant at Pittsburg, California. The company ships considerable finished material to Europe, much of its heavy and garden hose being distributed in the British Isles and the Scandinavian countries, to which it sends a salesman yearly. Freighting is done entirely by water, via the Panama Canal, and at very low rates.

Pacific Coast Mechanical Rubbermen's Golf Association, of which some thirty leading rubber goods manufacturers and distributers, will hold its annual tournament at the Rancho Country Club, Culver City, California, October 3 and 4. Twenty-five prizes have been donated, among them fifteen silver cups. A banquet will follow the games. The new officers are: W. A. Corder, Los Angeles, president; William Edris, Seattle, and Howard Middleton, San Francisco, vice presidents; and J. B. Lippincott, San Francisco, secretary and treasurer.

Columbia Tire Corp., Portland, Oregon, after being thoroughly reorganized and put in a stronger position than ever, is again in full production. Its new policy is to limit sales territory strictly to the Pacific Coast. The company produced its first C-T-C tire February 28, 1923, and a year ago its products were made standard equipment at the Ford branch plant in Portland. It has nearly 100 operatives, nearly all skilled workers, and every tire is built by hand in one of the best equipped factories of its kind in the country. William Cornfoot is the new president, succeeding R. A. Wurzburg; J. F. Cullen, superintendent of engineering, has been made manufacturing manager, succeeding R. H. Brown; A. A. Aya is vice president; K. C. Mohrhardt, secretary-treasurer; and on the board of directors are Amandee M. Smith, Ben C. Dey, George F. Hensner, and J. F. Cullen.

Los Angeles Rubber Co., of which W. A. Corder is president, 124 East 3rd street, Los Angeles, one of the largest distributers of mechanical rubber goods in the Southwest, has taken on tires and is carrying a complete line of Kenyons, which are said to find ready sale.

Firestone Tire & Rubber Co., has engaged Paul E. Jeffers, of Los Angeles, as consulting engineer to aid C. A. Myers, director and chief engineer of the Firestone company in Akron, in the construction of the new plant in Los Angeles. Mr. Myers announces that the contract for constructing the plant has been awarded to Curlett & Beelman, architects, of Los Angeles, and that all supplies will be obtained locally, if possible.

United States Rubber Co. is displaying in the windows of its Los Angeles branch, San Pedro and East 8th streets, the most striking exhibit of its kind ever shown in the Southwest. It depicts the principal stages of rubber production and manufacturing, as from the clearing of a jungle to the finishing of a giant pneumatic tire. Manager Magee says that the exhibit is the original one shown at the company's headquarters in New York City.

The Gorsul Battery Co., Inc., of which R. J. Gorman is president, has bought a building at 4517 East 48th street, Los Angeles, California, in which it will at once begin the manufacture of 50,000 hard rubber storage batteries, an order placed by Sears, Roebuck & Co. and to be filled within one year. The company is affiliated with the R. J. Gorman Co., Inc., of Seattle, also battery manufacturers, and it is planning to establish a branch factory either in San Francisco or Oakland to take care of midcoast business.

Goodyear Tire & Rubber Co., Los Angeles, California, had been averaging up to mid-July about 7,000 tires and 8,000 inner tubes a day. Some of the tire factory departments and sections of the textile mills adjoining have been doing two and three shifts a day for a long time. Service Manager W. H. Sorn of the parent Goodyear factory at Akron has been making a business trip along the Coast with L. C. Buxton, California service manager. P. H. Sullivan, in charge of the factory accounting department in Los Angeles, left August 13 for England, where he will fill an important place in the new Goodyear works being built at Woolverhampton.

Raybestos Company of America having acquired control of the Sectional Brake Lining Corporation of Los Angeles, the equipment used in making sectional transmission lining has been moved to Bridgeport, Connecticut, and Kirby Shellaby and Bob Mason, who have managed the concern, have gone to take charge of manufacture.

India Tire & Rubber Co. has leased a new building for storage at Bryant and 9th streets, San Francisco, California, that will afford 4,000 square feet of additional floor space and enable the company to make prompt deliveries in the eleven far west states. Possession will be taken on September 15.

United States Rubber Co., according to Pacific Coast Manager J. B. Brady of San Francisco, is making a hit with its new popular-sized and priced USCO Junior tires, and finds it hard to supply the sudden demand. Business in all the standard lines is holding up remarkably well, with total sales in units and values well above those for last summer.

Richmond City, Contra Costa county, California, is trying out rubber stop signals and apparently with much success. The signals are oblong blocks of a tough, resilient compound with the word "Stop" painted on them in recessed letters and set in the pavement so that one side is tilted. Unlike metal dome signs with sharp ridges, the new rubber ones allow cars to run over them without tire damage. When cars pass over them they merely bend and unharmed spring back into position.

The Firestone Tire & Rubber Co. and The B. F. Goodrich Co. will be manufacturing tires in their new branch factories in Los Angeles, California, early in 1928, according to Akron officials of these companies. Rapid progress is re-

ported on the Goodrich plant, which will cost about $5,000,000. Work on the Firestone factory is now getting underway. These companies found expansion on the Pacific coast necessary to take care of rapidly increasing tire sales.

California Firestone Deal Closed

Conveyance to the Firestone Tire & Rubber Co., Akron, Ohio, of a forty-acre site for a factory in Los Angeles was formally effected August 5 at a luncheon tendered by the local Chamber of Commerce to Russell A. Firestone, who had been deputed by his father, President Harvey S. Firestone, to close the deal. Young Mr. Firestone who has also been designated as head of the projected California Firestone Co., which will have charge of the new enterprise announced that the construction of the first unit will begin before October 1 and that the factory will start operations by April 1, 1928. The new factory will have a capacity of 5,000 tires and 7,000 inner tubes daily and have a yearly payroll of about $3,000,000.

Guests at the luncheon, besides Mr. Firestone, were C. A. Myers, director of the company and chief of engineering, who had surveyed the new site; Bernard M. Robinson, assistant secretary and general counsel of the company; and R. J. Cope, Los Angeles branch manager.

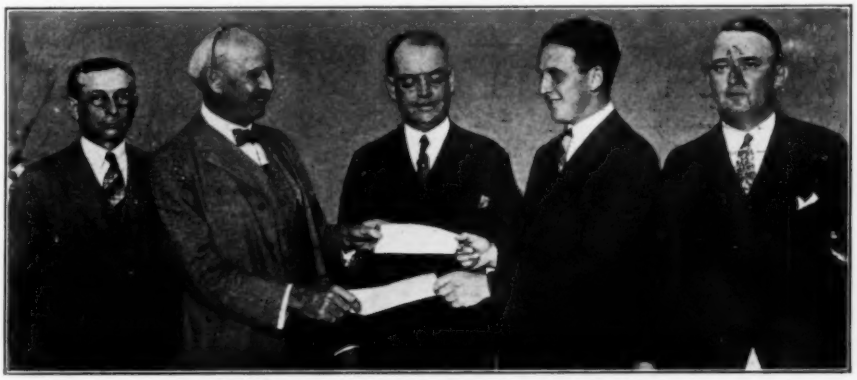
Residence of Late J. O. Stokes to be Sold

The handsome new residence of the late J. Oliver Stokes, former head of the Thermoid Rubber Co., Trenton, New Jersey, has recently been placed on the market by his estate. The Stokes' home was built at a cost of $300,000 and is one of the show places in Santa Monica, California. In its setting of beautiful natural scenery, near Beverly Hills and Los Angeles, the home is one of the finest in a land noted for its lovely residences.

Breaking Ground for Goodrich Factory

The B. F. Goodrich Rubber Co.'s decision to establish a factory in Los Angeles was hailed by Mayor Cryer as one of the most important events in the city's industrial history, at the ceremony of breaking ground for the new factory, recently. Daniel F. McGarry, president of the Chamber of Commerce, presided, and brief talks were made by Vice President C. B. Raymond of the Goodrich company, Director of Engineering S. B. Robertson, also of the Goodrich company; Assistant Traffic Manager R. B. Robertson of the Union Pacific Railway; and County Supervisor Fred T. Beatty. Also present were these Goodrich officials: Edward Barry, resident engineer; H. M. Bacon, Pacific coast manager; and F. L. Hockensmith, Los Angeles branch manager; with William Steele, vice president and general manager of the Foundation Company of America, to which had been awarded the principal contract. The California mission type of architecture will be featured in the buildings, and the grounds will be so landscaped as to minimize the factory appearance. Plant production is scheduled for about March 1, 1928.

Reading from left to right: C. A. Myers, director and chief of engineering, Firestone Co.; Samuel Storrow, representing landowners; D. F. McGarry, president Chamber of Commerce; Russell Firestone, representing Firestone Co.; Bernard M. Robinson, assistant secretary and general counsel, Firestone Co.



Delivering Deed for Firestone Los Angeles Site

PACIFIC COAST PRODUCTS

The distributing center for most of the Amazon Valley, and to some extent the neighboring states of Maranhao and Piauhy, is the city of Para, Brazil, near the mouth of the Amazon River. This area, with its population of 3,000,000 people, offers good prospects as a market for the Pacific coast products of the United States. There are, in this district, three cities of importance: Para, with about 220,000 people; Manaos, capital of Amazonas, 1,000 miles up the Amazon, has 76,000; and Sao Luiz, capital of Maranhao, a day's travel by steamer south from Para, with about 50,000.

Recent Coast Visitors

Paul A. Polson, special representative of the Polson Rubber Co., of Cleveland; Howard F. Smith, general sales manager of the General Tire & Rubber Co., Akron, Ohio; and F. Robert Lee, general sales manager of the Thermoid Rubber Co., Trenton, New Jersey, have been recent coast visitors.

Half Million Dollar Power Plant for Gates

On July 27, the Gates Rubber Co. broke ground for the construction of a half million dollar power plant designed to furnish light, heat and power for its group of twenty-one factory buildings in Denver, Colorado.

The building will be of structural steel, concrete and brick, three stories high. A series of 600 h.p. boilers, operating on 400 pounds steam pressure, will drive a group of 1,500 k.w. condensing steam turbines, and will be equipped with superheaters, economizers and electrical stokers. All coal and ashes will be handled automatically by electrically operated conveyers.

The new plant is being constructed under the direct supervision of Carl Ahlquist, chief engineer of the company, and will be ready for operation by February 1, 1928.

MANUFACTURERS CONFORMING TO GOVERNMENT SPECIFICATIONS

The Bureau of Standards of the United States Department of Commerce will supply prospective purchasers, desiring rubber goods made up according to government master specifications, with a list of the companies prepared to comply with such requirements and to certify to proper execution of the same. The lists compiled thus far include the following: rubber covered wires and cables, friction tape, rubber insulating tape, and electricians' gloves.

Canada

All sections of the industry are working hard to satisfy the demand for rubber goods. The prosperity of Canada is reflected in the increased number of cars purchased by Canadians during the first four months of 1927. In that period Canadians bought for use within the Dominion 67,798 new automobiles, an increase of 48 per cent over the first four months of last year and equaling the total yearly purchase of a very few years ago. With a population of about 9,000,000 Canada ranks second among car owning nations, based on proportion of cars to population.

All this of course reacts on the tire industry which at present is thriving with plenty of orders and a good outlook for the future. Orders for garden hose have increased owing to more seasonable weather; business in suction and delivery hose has also been good; and mechanicals, particularly for railway and motor-car work, have been in demand. Druggists' sundries shipments are all that can be expected at this season of the year.

Canadian Firestone Co., Hamilton, Ontario. During a recent visit to this plant, Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, and also president of the Canadian company, announced that the Canadian plant will be enlarged to increase its capacity by 35 per cent. It is just five years ago since the plant was opened and it has been in continuous operation for from 18 to 24 hours a day since it was started. The annual payroll is approximately $1,500,000.

Seiberling Rubber Co., Ltd., Toronto, Ontario, is utilizing poster advertising on the principal Ontario highways featuring Seiberling tires.

H. H. Galt, director and sales manager of Gutta Percha & Rubber, Ltd., Toronto, recenly spent his vacation with his family at Little Metis Beach, Quebec.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ontario, has placed on the market a new low priced tire called the New Pathfinder which is built in 30 by 3½, 31 by 4, 32 by 4, and 33 by 4 high pressure sizes, and in 29 by 4.40 balloon size, all built of supertwist cords.

Goodyear Tire & Rubber Co. of Canada, Ltd., Montreal branch, recently exhibited in its show window an array of Goodyear tires bearing a show card with the following matter: "The one hundred millionth (100,000,000) tire was made by Goodyear June 3rd, 1927."

Dominion Rubber Co., Ltd., Montreal, recently had on exhibition a signed testimonial and an original pair of rubber boots sold in 1894. The letter stated that the "rubber in these boots is just as soft and pliable as the day they were bought." These show windows of the Dominion company are a wonderful educational display of the firm's products. Recently the manufacture of Dominion Royal Cord balloon tires was shown.

J. Leckie & Co., Ltd., Vancouver, British Columbia, has placed a new golf shoe on the market which is meeting with great approval from sportsmen all over the Dominion. The sole is a mixture of rubber and cotton which grips the turf of the golf course and is made in three styles. The other shoe has the Gro-cord type of sole which is made like a cord tire, being especially adaptable to golf requirements during the winter season.

Imports of golf balls are increasing at a rapid rate. Taking the population of the Dominion of Canada at nearly 9,000,000 one golf ball was imported for every sixteen persons during the twelve months ending April, 1927. Total imports for the twelve-month period were 45,467 dozen golf balls, value $185,743, compared with imports of 40,490 dozen, value $166,975, during the previous twelve months.

Canadian Imports Show Increase

Canadian rubber imports during June while showing a decrease over May were considerably in excess of imports during June, 1926, according to the Dominion Bureau of Statistics.

Rubber imports during June were valued at $2,362,873 as compared with imports valued at $2,734,066 during May and $1,776,315 during June last year.

Imports for which statistics are shown include crude and manufactured rubber.

Canadian exports of rubber goods showed large increases for the month when compared with the same month last year. Exports of automobile tires totaled 174,164 tires valued at $1,762,007, compared with 87,420 tires valued at $1,239,116 during June, 1926. During the same period 225,081 inner tubes valued at $393,335 were exported compared with 101,050 tubes valued at $247,764 during June last year. Total exports of rubber goods from Canada were valued at $2,766,191 as compared with $2,127,953 during June last year.

The Canadian National Exhibition, to be held in Toronto from August 27 to September 10 will mark the forty-seventh consecutive year of continued activity. The "Show Window of a Nation" as this fair is usually referred to will, as in the past, house some interesting educational and attractive exhibits from leading Canadian manufacturers in the rubber industry.

Canadian Goodrich Factory Addition

Canadian Goodrich Co., Ltd., Kitchener, Ontario, will erect an addition, 100 by 150 feet, to the present factory buildings, the approximate cost being $150,000. T. B. Tomkinson, vice president and general manager, states that no definite figure above the 900 now employed can be given as to the number of additional employes that will be required through the increased manufacturing facilities. The fact that the Goodrich company is expanding its Kitchener plant is further evidence of the confidence and faith held by business men in the soundness and future of Canada and the importance of Kitchener as a manufacturing and commercial center.

Rubber Section, N. S. C.

The Rubber Section of the National Safety Council, holding its sixteenth annual congress in the Stevens Hotel, Chicago, Illinois, will have a breakfast meeting for officers, committeemen and speakers on Tuesday morning, September 27. A motion picture film of scenes on rubber plantations will be shown at the general meeting that morning and addresses will be given by Chairman W. L. Schneider; H. W. Low, Miller Rubber Co., whose subject will be "Knives and Shears"; and Paul Van Cleef, Van Cleef Bros., who will speak on "The Important Part Safety Holds in the Rubber Industry."

Wednesday morning's meeting will include the report of the engineering committee, presented by J. E. Congdon, U. S. Rubber Co.; S. Mansfield, Goodyear Tire & Rubber Co., will report for the statistics committee; L. J. Healey, Fisk Rubber Co., and J. Newton Shirley, Hood Rubber Co., will speak on "Health Hazards of Compounding Materials"; and R. Lawler, U. S. Rubber Co., will be heard on "Safety Kinks in the Rubber Industry."

At the session of the Textile Section, H. C. Washburn, of the Fisk Rubber Co., will tell about "New Developments in Safeguards for Textile Machinery."

The Norwalk Tire & Rubber Co., Norwalk, Connecticut, announces the addition of E. W. Dorch to its sales force. Mr. Dorch was affiliated for a number of years with the Hood company, and will cover Connecticut for Norwalk.

The Rubber Industry in Europe

Great Britain

Whatever directors of British rubber-producing companies may think or say of rubber restriction, it is quite clear from recent correspondence in the *Financial Times* that shareholders are not as happy over the results, or rather lack of results of the restriction scheme. The constantly increasing stocks, the prices which refuse to go up above the pivotal price in spite of repeated cuts in the export quota are causing much uneasiness.

J. Ross Macmahon, about a month ago, proposed to the shareholders in British owned rubber estates that they should form a pool under the direction of the Rubber Growers' Association. Each shareholder should put up about 5 pounds with which rubber would be purchased and held until the market had sufficiently improved. It seems there are altogether 600,000 shareholders and if all could be induced to join in the scheme, something definite might be attained.

Less optimistic opinions are held by some, but even these believe that a pool should be formed to buy up about 40,000 tons of rubber, which would result in prices going up to about 2 shillings per pound. Others again suggest that British estates should stop tapping for one month.

Metallized Rubber Paving Blocks

A new process for producing rubber paving blocks has been patented by C. D. Rotch, The Elms, Park Road, Teddington, Middlesex, and A. I. Gates Warren, 17 Chatsworth Road, West Norwood, London, S. E. 27. This process consists in the formation of a metal sulphide on the under surface of a rubber block and the reduction of such sulphide to a metallic layer whereby the block obtains an under metallic surface capable of being secured to a road foundation.

Sulphur or sulphur bearing compounds are incorporated in the rubber block to assist in vulcanizing part or all of it. The block may be of homogeneous quality or consist of laminated compounds of two different qualities, the wearing surface being of one kind and the attachment surface of another. The attachment surface is first treated with metal dust or salt in a vulcanizer so that a sulphide of the metal is formed, permeating the surface of the block to a substantial depth. This sulphide is then reduced so that an adherent coating of metal is formed on the block on which additional layers, to a substantial thickness, may be electrically deposited. The contacting medium should be zinc or iron and the sulphur compound of the metal is reduced to the metallic state by electrolytic reduction baths.

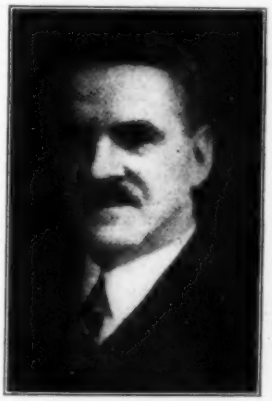
To avoid delay in subsequent deposition, a metallic matrix mold, which would form a permanent part of the block, could be used. The mold is coated with the contacting agent and the rubber is packed into the mold either as a mass or in layers. The whole is then vulcanized after which the rubber block can be removed from the mold, with its surfaces previously contacting with the metallizing agent impregnated with a sulphur compound of the metal between the mold and the rubber. This surface is now reduced and if necessary a thin coating of a like or dissimilar metal applied, when the block is replaced in the mold. To insure adherence between the metal surface of the rubber block and the mold, a dusting of fusible metal powder which melts and unites the surfaces of block and mold at a temperature below that of vulcanization is inserted between block and mold. The rubber blocks may be fashioned so as to provide a key for cement or for being secured to a leveled or road metaled track.

Institution of the Rubber Industry

The council of the Institution of the Rubber Industry has decided to grant a limited number of long service diplomas to those members who, through long practical experience, have done their bit for the rubber industry. To qualify for these diplomas, members must have reached the age of fifty years, be of British nationality, have had at least 25 years' practical experience in the rubber industry, and occupy some position of trust or responsibility, as foremen or managers. Certificates will be granted without entrance fee, the period during which they will be awarded under the special regulations, extending for six months from July 1, 1927.

English Goodyear Personnel

Officials of the new Goodyear tire plant at Wolverhampton, England, have now been appointed by President P. W. Litchfield. They are: Charles P. Skinner, who is to be managing director; T. A. Linnane, general superintendent; George E. Price, Jr., will be in charge of purchasing, temporarily; Robert T. Brown, manager of the development department; Paul H. Sullivan, director of administrative work, fiscal and accounting; W. D. LaDue will have charge of engineering at the new plant, and E. G. Wortman is to be personnel manager. In addition, Edward Sheahan will be in charge of Division A of the factory, while Edward Kelly will be head of Division B.



Charles P. Skinner
Managing Director

The capital of the company is £800,000, which has practically all been subscribed for, in cash at par, by the American company, and a loan capital of £800,000 6½ per cent debenture stock has been offered for subscription in England.

The directors of the new company are: Sir James Alexander Cooper, K.B.E., director, The United Molasses Co., Ltd.; Sir Arthur Lowes Dickinson, Shottersley, Haslemere, Surrey, chartered accountant; Paul W. Litchfield (chairman), Akron, Ohio; Charles P. Skinner, 1 Links-road, Epsom, Surrey; Charles A. Stillman, Akron, Ohio. The secretary is A. R. Sadler, and the registered offices of the new company are at 15 Lots-road, Chelsea, S.W. 10.

British Notes

The Tyre Investment Trust, in the report for the year ending February 28, 1927, states that conditions in the automobile tire trade in the territory of the Far Eastern companies in which it is interested were difficult during 1926, and that during part of the year prices were not remunerative. However from

the beginning of 1927 a considerable improvement has been noted. The trust, which derives its revenue from holdings in the Dunlop Rubber Co. (Far East), The Dunlop Rubber Co. (China), The Dunlop Rubber Co. (Straits Settlements), and the Dunlop Tyre & Rubber Goods Co., received £85,904 during the year as compared with £150,584 the year before. After deducting all expenses, taxation, interest charges, the net profit was £61,066 as against £127,855. The dividend on the per cent preference capital absorbed £70,000, leaving £66,727 to be carried forward against £75,661. The Trust again received no dividend from its investment in the Dunlop Tyre & Rubber Goods Co. of Canada. The Trust increased its investments by £26,250, a further issue of the Dunlop Rubber Co. (Straits Settlements), the whole of which was acquired by the Trust.

George West (Weatherproofs) Ltd., is the name of a "public" company formed to acquire the whole of the share capital of five London concerns manufacturing and distributing raincoats and weatherproof garments. The companies are: George West, Ltd., Express Rubber Co., Ltd., Popular Warehouses, Ltd., Empire Waterproof Co., Ltd., and Telemac, Ltd., all of London. The nominal capital of the new company is £300,000 in 125,000 seven and a half per cent cumulative participating preference £1 and 3,500,000 ordinary 1s. shares.

Foreign Tires. Recently in the House of Commons, the member for Argyll, Mr. Macquisten, proposed an amendment to be inserted in the Finance Bill, to the effect that foreign automobile tires actually in transit on April 12 should be exempted from the tire duty which of late went into effect in Great Britain. When put to the vote, the proposal was defeated.

Messrs. Symington & Sinclair, well-known London rubber dealers, announce that they have admitted W. P. Bridgett into partnership, July 1, 1927. Mr. Bridgett has been associated with the firm since it commenced business.

PUNCTURE PROOF TIRE

At the Economic Rubber Works, Richmond, Melbourne, the process of manufacturing the new puncture-proof tire for automobiles, invented by A. Lagruta, was demonstrated to a large number of those interested. It is claimed that the new tire is not only unpuncturable, but just as resilient as the ordinary pneumatic cord tire. The tire is not constructed on quite the same principle as the cushion type of tire, although it has concealed air-pockets which are supposed to reduce the weight, as compared with that of a solid tire, by about 30 per cent and to give it a resilience claimed to equal that of a pneumatic tire.

Germany

The use of smaller tire and felly sizes is spreading. Here in Germany, the Continental Caoutchouc-und-Guttapercha Compagnie, Hannover, is the pioneer and has already taken up the 18 inch tire besides the 19 inch tire. The new size is to be used in combination with drop center rims. The firm wishes to supply only two fellies for the various tire sizes. The 18 inch felly with width of 4 inches will fit four sizes, namely: 26 by 4.40 inches, 27 by 4.75 inches, 28 by 5.25 inches; 27 by 4.95 inches; that is for smaller cars. The 20 inch felly will likewise fit four sizes and is destined for heavier cars. The sizes are: 30 by 5.25 inches, 30 by 5.77 inches, 32 by 6 inches and 32 by 6.75 inches.

The important part that rubber plays in the paper industry is very well demonstrated at the Paper Exhibition now being held at Dresden. First there is the rubber hose of various sizes which supply water to the various rolls. This hose is manufactured by the Continental Caoutchouc-und-Guttapercha Compagnie, Hannover, the Harburger Gummiwarenfabrik Phoenix, Vereinigte Berlin-Frankfurter Gummiwarenfabrik. Then there are the rubber conveyers which convey the paper to the felt cloths; besides a number of different kinds of rubber rolls serving a variety of purposes in connection with the paper industry. Besides the first and last of the companies mentioned above, Franz Clouth, Koln-Nippes and Felix Bottcher, Leipzig, supply these goods. Other rubber articles are rubber suction fingers which hold the sheets of paper in fly- and platen presses, compressed air and suction tubes, and finally rubber press-cloths. Press cloths for small and large presses are manufactured by J. Landsberger, Berlin, A. Reinshagen, Leipzig, and Eugen Zeiss, Dresden.

German Notes

The Sporting Goods Exhibition which was to have been held this fall at Leipzig, will not take place as scheduled. The Leipzig Textile Fair reports that the rush of inquiries for space has been so great this time, that it finds it impossible to reserve space for the special sporting-goods division. However it is planned to let the Sporting Goods Exhibition take place at the next Leipzig Spring Fair.

German exporters are as usual making strenuous efforts to regain their hold on foreign markets and to expand those they already have. However, they do not appear to be equally successful in all lines of industry. High tariffs in various foreign countries form a barrier which the German manufacturers find it hard to break through in spite of the fact that they offer goods at prices that hardly leave them a reasonable profit. This is once more illustrated by the report of the Dresden Chamber of Commerce for the first quarter of 1927 in which it says, concerning the rubber industry in the Dresden district, that there was a bigger local demand but that it was found impossible to increase sales abroad. The report adds that prices of manufactured goods have not yet been brought into proper relation to costs of production.

The Continental Caoutchouc & Guttapercha Compagnie, Hannover, it is learned, plans to close its English branch because it can no longer compete with local firms as a result of the new duty on tires and tubes recently imposed by the British Government. The *Gummi-Zeitung* here takes occasion to contrast the attitude of the British Government as regards duties with that of the German Government which wishes to lower the already comparatively low German duty on tires. Incidentally, this is striking confirmation of the statements made above regarding German foreign trade.

The Runge Werke A. G. Spandau, the most important German reclaim works, in its latest business report states that in order to be able to keep up with the world developments in connection with reclaims, it was forced to expend rather large sums of money on expansions and new machinery. In addition, a firm with which it had dealings failed, so that after writing off the necessary amounts, it closes its balance for the past year with a total loss of 82,530.25 marks. In 1926 the firm had a productive capacity of 3,000 tons, an amount which it could easily double for the coming year without going to too great expense. In the course of the report an interesting comparison was made between America's and Germany's consumption of crude and reclaimed rubber in 1913 and 1926, the figures in long tons being given in the following table:

	1913 Tons	1926 Tons
World Consumption of Crude Rubber	108,000	600,000
Germany's share	30,000	30,000
	=27.8%	=5%
America's share	30,000	450,000
	=27.8%	=75%
World Consumption of Reclaim	10,000	200,000
Germany's share	2,500	5,000
	=25%	=2.5%
America's share	5,000	160,000
	=50%	=80%

The Rubber Industry in the Far East

Malaya

With many of us, opinion of the value of restriction see-saws up and down with the fluctuations of the market price. When prices were high, restriction was capital. Now that they are low and stocks are up, we are convinced that it should be abolished. But even now when reports show that stocks have declined by a few hundred tons as compared with the week before, a flutter of expectation goes through our ranks and we all sit back and wait hopefully for restriction to take effect. Then after a rise of a few half-pence or less, the market sags again, the next week stocks show another increase and we all want to know what is the use of restriction anyway. We rant against the Dutch, the Americans, the Government and anybody and anything that we can think of to throw the blame on. There is really little cause to wonder at this, for our nerves are very much on edge at the way restriction fails to act up to specifications, and it is hard for those of us who are weaker to keep faith in restriction, that saved us from ruin, especially when leading planters tell us that we are facing a situation that is similar to that of 1922.

At least Mr. Arter, at a recent meeting of the Planters Association of Malaya said as much. To quote him: "We find ourselves in much the same position with regard to stocks as we were first in 1922."

Analyzing Restriction

Such being the case, restriction comes in for very close scrutiny, and even its very warmest advocates cannot deny that it is not functioning correctly. As A. W. S. says in his weekly letter in the Rubber Supplement of the *Straits Times:*

The present trouble is, that restriction is only half working. The combined standards of Malaya and Ceylon have been increased by 42,869 tons, to which must be added the combined carry-over of unused rights, 38,472 tons, making a total of 81,341 tons, which is a big set off for restriction. If to the exportable for standard we add 6,000 tons for Singapore and Penang, and 12,000 tons for small-holder allowances, assume that all the unused rights will be used, and that the exportable will remain at 60 per cent until the end of the year, the total exports from Malaya and Ceylon in 1927 may be 318,067 tons, which is only 27,076 tons less than was exported in 1926 when for nine months exportable was at 100.

What Does Restriction Restrict?

In connection with this calculation, we should like to point out that the amount restricted would probably work out at still less than the modest figure of A. W. S. if we take into consideration the effect of smuggling. At a recent meeting of the Balgownie Rubber Estates, Ltd., Mr. Kindersley, the well-known rubber man, called attention to the alarming proportions that smuggling from Malaya have assumed. He had a lot to say about the way in which this problem is and was handled, to which we shall return later. But what is of interest here is his statement that as much as 3,000 tons a month are smuggled. This figure may be exaggerated but the fact remains that large quantities of rubber shipped to Malaya as Dutch native rubber is really Malayan smuggled rubber.

As has been repeatedly pointed out in these columns the Dutch native exports have an uncanny way of rising as the exportable for the restriction area falls. Latest official statistics show that during the first half of 1927, when prices were none too high but the restricted percentage around 60 per cent, native rubber shipments to Malaya were 87,418.96 tons against 66,277.58 tons for the corresponding period of 1926, when prices were still at a high level but 100 per cent exportable had been in force for five months. At this rate of increase if even half the surplus native rubber shipments consists of smuggled rubber, A. W. S.'s figure must be further reduced by over 20,000 tons, and if the figure quoted by Mr. Kindersley, 3,000 a month, or 36,000 should prove to be correct, then what in effect does restriction restrict, at least in 1927?

More Obstruction

Thus we see that the Stevenson scheme that meant so well and that probably has served its purpose, is obstructed on every side. There are excessive standards, unused rights, smuggling, to combat with. But this is not all. The very terms of the scheme as revised the last time make for defeat. It has struck more than one person that the clause providing that the percentage will not be decreased below 60 per cent is dangerous. A. W. S. points out that price squeezing can be practised freely because it cannot result in less exportable. The lowest basis has already been reached. Then there is the pivotal price. Many among those who otherwise favor restriction, do not like the price of 1 shilling 9 pence, which is considered too high. Defenders of the price level say that while a lower price is fair enough with full production, the higher price is necessary to help restricting planters to make an even break. But if all the figures quoted above are correct and there is practically no actual restriction, although planters may think that they are cutting their exports to 60 per cent, why then, to be quite frank, it is evident the planters are not losing very much.

Important Deductions

Restriction, then, may fairly be termed impotent, at least as far as 1927 is concerned. Still there may be some who have recollections of leakages in the system from the very beginning. For instance, smuggling has been rife from the outset, in the early days hoarding was widely indulged in and even now traffic in coupons has not ceased. It does not serve any purpose to dwell too much on what happened in the early years of restriction, but from results of investigation into its present workings, a very important deduction may be made and that is that should restriction cease tomorrow, the psychological effect of such action might result in a sudden break in the prices, but the actual effect as far as the statistical position is concerned would be very slight indeed. We would not suddenly find 40 per cent more rubber from the restriction area dumped on the market, nor anything like it!

In other words we have been getting and are still getting about as much rubber from the far eastern plantations as we are likely to get until the newer plantings come into bearing, that is until 1930 when, as most authorities are agreed, a considerable increase in mature areas may be looked for in the future.

Exports and Unused Coupons

Official statistics of duty paid exports from Malayan restriction area during June were: Federated Malay States, 9,543 long tons; Straits Settlements, 2,218; Johore, 3,436; Kedah, 1,338; Kelantan, 339; and Trengganu, 171, in all 17,045 long tons. There were no exports at excess rates.

The balance of unused coupons carried forward to July is as follows: Federated Malay States, 14,312 long tons; Straits Settlements, 4,373; Johore, 4,230; Kedah, 1,111; Kelantan, 1,759; total, 25,785 long tons.

Figures for Trengganu are not yet available. Credits issued in June (not including Trengganu) amounted to 2,230 long tons.

Netherlands East Indies

The International Association for Rubber and Other Cultivations in the Netherlands East Indies, in its thirteenth annual report, publishes some detailed figures regarding rubber cultivation in the Netherlands East Indies in 1925.

At the end of 1925 the total area of European estates under rubber was as follows:

	Planted Area Acres	Productive Area Acres
Java	446,000	318,778
Outer territories	579,428	433,115
Total	1,025,428	751,893

The area planted to rubber in the Outer Territories is divided as below:

	Planted Area Acres	Productive Area Acres
East Coast Sumatra	423,867	331,485
Acheen and dependencies	42,887	31,223
Tapanoeli	19,147	14,495
West Coast of Sumatra	2,271	1,787
Benkoelen	1,121	761
Lampong districts	24,581	18,271
Palembang	5,716	1,971
Djambi	538	173
Riouw and dependencies	31,458	19,497
West Borneo	11,426	7,731
South East Borneo	13,985	4,972
Menado	899	548
Celebes and dependencies	1,359	143
Amboina	146	69
Bali and Lombok	27	..
	579,428	433,115

The production of plantation rubber, exclusive of native rubber was 106,047 metric tons for the whole Netherlands East Indies, while exports, including native rubber came to 233,978 metric tons.

The following table shows comparative figures of production and exports during 1921 and 1925, native rubber figures being included in the exports only. Quantities are in metric tons of 1,000 kilos.

	1921 Production Metric Tons	1921 Exports Metric Tons
Java	24,513	29,314
East Coast of Sumatra	32,557	34,985
Acheen and dependencies	....	....
West Coast of Sumatra	24	60
Tapanoeli	934	1,279
Benkoelen	....	24
Lampong districts	1,079	610
Palembang	46	83
Djambi	37	2,915
Riouw and dependencies	782	1,287
Banka	...	31
Biliton	...	1
West Borneo	144	2,074
South East Borneo	263	760
Menado	75	72
Totals	60,454	73,505

	1925 Production Metric Tons	1925 Exports Metric Tons
Java	44,405	47,358
East Coast of Sumatra	47,994	64,059
Acheen and dependencies	4,175	3,039
West Coast of Sumatra	315	3,184
Tapanoeli	2,668	6,012
Benkoelen	24	583
Lampong districts	2,411	1,822
Palembang	242	18,234
Djambi	50	29,341
Riouw and dependencies	2,112	10,314
Banka	....	1,862
Biliton	....	106
West Borneo	903	21,572
South East Borneo	602	26,337
Menado	126	146
Totals	106,047	233,973

The tabulation shows clearly the enormous expansion that native rubber has undergone. Centers that in 1921 were of little or no importance, as exporters of this type of rubber, in 1925 are listed with very considerable shipments, the most striking examples being Palembang which in 1921 exported 83 tons of rubber, including native, while in 1925 the figure was 18,234 tons, chiefly native. Another instance is that of South East Borneo which in 1921 exported 760 tons but in 1925 came near the top of the list with 26,337 tons.

The growth of the native industry is still more clearly shown in the table below which gives figures of native shipments exclusively:

	1921 Tons	1925 Tons
Djambi	2,915	30,511
Riouw and dependencies	600	7,863
Palembang	83	17,073
East Coast of Sumatra	....	16,648
West Coast of Sumatra	....	1,921
West Borneo	1,800	21,133
South East Borneo	600	26,299
Tapanoeli	....	3,528
Benkoelen	....	953
Banka and Biliton	....	2,303
Lampong districts	....	193
Totals	5,998	128,425

These figures represent wet rubber.

Progress in Budded Rubber

The first experiments with budding of Hevea were undertaken in 1916 and 1917 by W. M. van Helten in the Cultuurtuin of Buitenzorg and by G. F. Bodde, at the time manager of the Pasir Waringin Estate, after consultation with Dr. P. J. S. Cramer. The oldest plantings in the Cultuurtuin is plot L IV, where bud grafts of three clones, budded in the beds, in 1917, were planted out in February, 1918. At Pasir Waringin two clones were planted in January, 1916, and in 1917 about fifteen. At Madjau two more clones were also planted in 1918, while in the beginning of the same year an area of 19.7 bouws (bouw = 1.75 acres) were planted with ten clones, the bud-wood coming from Pasir Waringin.

Naturally all kinds of difficulties had to be overcome in the early years; many mistakes were made, and it is therefore little wonder that later on many of these plantings were found to include false buddings, due to the fact that among other errors shoots from the stock were taken for the true bud graft. So that it was found necessary to go over all these trees one by one and check them up by identifying the seed types. This work was begun in 1925 at Bodjong Datar and continued in 1926 and 1927.

The total yields obtained from the 19.7 bouws of bud grafts at Bodjong Datar were 360 kilos per hectare in 1924 and 330 in 1925, nothing extraordinary, therefore, and confirming the experience that with untested clones there is every chance of finding medium and even poor producers, while the number of superior clones is comparatively slight.

In 1925 the seed of 487 trees were inspected and in 1926 of 1,272 trees, groups were then formed of trees which according to this inspection belonged together, that is, to one clone, and yields were noted. However, when these same trees were inspected again in the following year it was found that there were still a number of trees included which did not belong among the true bud grafts. Corrected yield figures are now available for seventeen groups for the period June 1926-May, 1927, the tapping system being 1/3 of the circumference every other day.

Tapping Yields

The yields for the different groups varied considerably and ranged from an average yield of 49.6 grams per tree per tapping to 6.5 grams per tree per tapping. There were three particularly good clones, PW. 94-II, comprising 8 trees, average yield per tree per tapping of which was 49.6 grams; PW. 60-I, including 93 trees, 44.7 grams, and P.E. 24-II, 29 trees, average yield, 41.2 grams. These compare very favorably with tested clones in the Cultuurtuin, Buitenzorg, Java and in East Coast Sumatra, and have therefore been ranked under the "temporarily approved clones." The yields of the three next best clones were a good deal lower, but still sufficiently good, and are being kept under observation. These clones yielded on an average per tree per tapping, 32.1, 28.7 and 23.7 grams, respectively.

Dutch Selling Combine

It is learned that a committee has been formed of leading Dutch rubber producers to study the question of the formation of a sales organization for rubber similar to that of the Java sugar producers. The chairman of this committee is F. P. J. Vester, director of the Nederlandsche Handel-Mij. Other members of the committee are: A. G. N. Swart, president of the International Association for Rubber in the Netherlands East Indies; Dr. C. J. K. van Aalst, D. Birnie, Professor M. W. F. Treub, P. van Leeuwen-Boomkamp, G. H. Crone and others interested in rubber. Depending on the support that the plan will receive, it will be decided whether cooperation of the English, French and Belgian producers will be sought.

The news of this sales organization that the Dutch are planning has been somewhat sarcastically received by a certain section of the London press, which considers it rather curious that the Dutch, who refused to cooperate with the English in restriction, should now seek cooperation of the English in a scheme of their concocting.

Rubber Propaganda of the Netherlands East Indies

The Fourth Annual Report of the Propaganda Department of the International Association for Rubber and Other Cultivations in the Netherlands East Indies contains a good deal of material of interest to American readers

THE activities of the Propaganda Department are many and various; it cooperates with the Government Rubber Institute at Delft, the Rubber Experiment Station at Java and the General Experiment Station at Medan, Sumatra, in addition to the Rubber Growers' Association, London. With the latter association it participated in the Leipzig International Spring Fair, 1927, and the results were so very satisfactory that the preliminary steps toward participation in the Spring Fair of 1928 were immediately taken.

Among the most important problems receiving the department's attention are sole crepe, rubber paving, rubber flooring, latex, etc. With regard to sole crepe, it seems that progress is hampered by the fact that the rather small number of sole crepe producers sell chiefly to London dealers who appoint distributers on the Continent from whom those interested must buy at prices that render it impossible to supply customers at competitive prices, so that frequently interest is lost in the matter.

Sole Crepe Contest

A competition had been organized by the department to find means of preventing sole crepe from slipping on wet pavements, but though the reward offered for the best suggestion was 2,000 guilders (about 800 dollars), not one of the 45 entries was found of sufficient merit to get the prize, nor even a special smaller one.

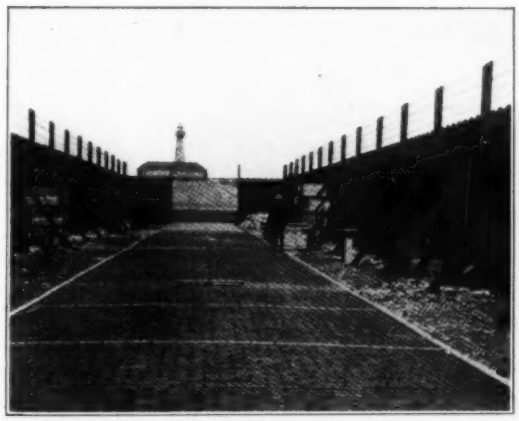
Rubber Flooring

Important results, which however cannot be made public until investigations have been completed, have been obtained in connection with the problem of laying rubber flooring. Interest in this matter is not confined to Holland and results of the work in this field are looked forward to by foreigners also, as is testified by the number of enquiries from foreign sources received by the department.

Rubber Paving

Last July the work of laying an experimental rubber roadway in the neighborhood of the Fishery Harbor at Scheveningen, near The Hague, was begun with rubber blocks supplied by the Roadways, Ltd., London. As far as possible, the blocks were laid in the same way as around the Cenotaph in London. The principal difficulties experienced there were cracks in the road surface and creeping of the blocks in the direction of traffic.

The department found that the fundamental cause of the cracks was the great difference in expansion between the rubber road and concrete bed due to the sun's heat. In consequence, the grouting material was pressed out of the joints. Then when cooling off, the blocks shrank in groups and cracks appeared in the road surface between these groups.



Rubber Roadway at Scheveningen

Creeping was first thought to be due to the forces exerted on the road surface, particularly when brakes were put on motor vehicles. But by grouting in the concrete bed and the joints between the blocks, such movements are apparently prevented under certain circumstances, as no displacement of blocks was observed when an 8-ton motor truck was driven over the road. Even when the brakes were put on suddenly, not the slightest displacement of blocks in one definite direction was observed, although the methods used were such, that even a movement of ⅓ mm per meter of the road length would have been indicated.

If the blocks do creep, as around the Cenotaph, it is suggested that again the difference in expansion of rubber blocks and concrete bed under the influence of strong sunshine is the prime factor. For the grouting material will be completely pressed out of the lengthwise joints at a much more rapid rate by the expanding rubber blocks than from those running cross-wise. When all the grouting material has been pressed out, further expansion causes a compression of the courses which are pinched between the kerbs and a tendency to kink is created which takes place under the influence of traffic and in the direction of traffic, and may be transmitted from one course to another. So that, briefly, creeping seems to be a phenomenon induced by the difference in expansion between rubber and concrete.

The problem, therefore, would be solved by using blocks of special type, the upper part being rubber and the lower of a material having a coefficient of expansion similar to that of the roadbed, if, and here is the really great difficulty, a satisfactory way of fixing the rubber to the base could be found.

Latex and Its Uses

Regarding the preservation of foodstuffs by means of latex coatings, previous findings were confirmed, namely, that large scale experiments are only justified in the case of tomatoes.

Dr. W. de Visser, chemist of the Propaganda Department, found an interesting new use for latex. By brushing the backs of rugs and carpets with one or two coatings of latex, slipping on polished floors is prevented and the rugs lie on the floor as though they had been tacked down. It subsequently developed that the same idea had also occurred to others.

Rubber Patents, Trade Marks and Designs

United States

July 5, 1927*

1,634,253 TIRE. Nicola Constanzo, New York, N. Y.

1,634,313 SWIMMING BAG. Hachig A. Ayvad, West New York, New Jersey.

1,634,314 SWIMMING BAG VALVE. Hachig A. Ayvad, West New York, New Jersey.

1,634,537 RESILIENT LIFT FOR BOOT AND SHOE HEELS. Charles Emanuele, assignor of one-half to Frank J. Deibel, both of Cleveland, Ohio.

1,634,540 OVERSHOE. Harry C. Harrison, Taplow, assignor to St. Helen's Cable & Rubber Co., Ltd., Slough, Bucks, both in England.

1,634,553 TIRE SIGNAL. Cameron W. Ostrem, Brewster, Washington.

1,634,589 TIRE PROTECTOR. Lucien Paul Celestin Lotte, Paris, France.

1,634,618 FOUNTAIN PEN. Oscar B. Hjorth, assignor of one-half to William H. Skilfen, both of Janesville, Wisconsin.

1,634,878 WINDOW RUNWAY. Carlos J. McKinney, Derotit, Michigan, assignor to The Republic Rubber Co., Youngstown, Ohio.

1,634,895 RESILIENT SUPPORT FOR VEHICLE BODIES. William N. Amery, New York, N. Y., assignor to Arch-Cushion Corp., a corporation of New York.

1,634,946 BODY SUSPENSION FOR MOTOR VEHICLES. William B. Jupp, New York, and George O. Hanshew, Brooklyn, assignors to International Motor Co., New York, both in New York.

1,635,084 REVERSIBLE FOLDED STAIR COVERING. Elias Hyman, New York, N. Y.

1,635,094 SAND BAG. Emil Nestler, New York, N. Y.

1,635,105 TIRE RIM. Benjamin J. Zobel, Buffalo, New York.

July 12, 1927*

1,635,176 APPLICATOR. Frank C. Dorment, Wellington, Ohio.

1,635,185 BELT JOINT. Elmer G. Kimmich, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,635,194 CUSHION TIRE. Walter E. Shively, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,635,295 VALVE DEVICE. Emil Tyden, Evanston, Illinois.

1,635,298 STOCKING PROTECTOR. Hazel Crawford Willette, Rhinelander, Wisconsin.

1,635,362 DETACHABLE TIRE WHEEL. John Henry Gildersleeve and Henry James Faint, Corona, New York.

1,635,424 GARMENT SUPPORTER. Rockwell M. MacCormac, Kansas City, Missouri.

1,635,472 BOWLING PIN. George Philip Geiser, Chicago, Illinois.

1,635,516 CINEMATOGRAPH FILM MATERIAL. John Edward Thornton, London, England.

1,635,596 TREAD ATTACHMENT FOR TRACK LINKS. Rollin H. White, Cleveland Heights, Ohio.

1,635,789 NURSING BOTTLE HOLDER. Bettie Hyman, Richmond Hill, New York.

1,635,835 INFLATABLE TOY. William D. Good, Akron, assignor to The Good Rubber Co., Kenmore, both in Ohio.

1,635,884 SHOE LACE. Michael K. Gilewicz, New York, N. Y.

1,635,906 WINDSHIELD ATTACHMENT. John E. Reed, Quinter, Kansas.

1,635,946 TIE EMPLOYING ELASTIC TAPE. Harry Barnett Mapou, assignor of one-half to Jacob M. Green, both of New York, N. Y.

1,635,957 REENFORCED AIR HOSE. Allan S. Richardson, Butte, Montana.

1,635,969 INFLATABLE TOY. John F. Winkler, Painesville, Ohio, assignor to The Wooster Rubber Co., a corporation of Ohio.

1,635,976 STORAGE BATTERY CONTAINER. Leon O. Percy, assignor to The Cooper Corp., both of Cincinnati, Ohio.

July 19, 1927

1,636,045 DEMOUNTABLE RIM. Walter E. Copithorn, Natick, Massachusetts.

1,636,099 CUSHION CONNECTION FOR VEHICLE CONSTRUCTION. Fred L. Lipcot, assignor to The Rubber Shock Insulator Co., Inc., both of New York, N. Y.

1,636,101 CORRECTIVE DEVICE. Rob Roy McLallen, Oak Park, Illinois.

1,636,107 GARTER. Charles B. Namiot, New York, N. Y.

1,636,109 ATTACHING DEVICE. Hendrik Plomp, Amersfoort, Netherlands.

1,636,177 CENTRIFUGAL DRYING MACHINE EMPLOYING RUBBER. John S. Gage, Chicago, Illinois, assignor to Tolhurst Machine Works, Troy, New York.

1,636,243 PIPE LAYING IMPLEMENT. Albert E. Rasmussen, Yakima, assignor of one-half to Arthur B. Fosseen, Spokane, both in Washington.

1,636,248 VEHICLE BUMPER. Henry John Schuette, Quincy, Illinois.

1,636,260 CHAIR ROCKER CUSHION. Vernon Teel, Trousdale, Oklahoma.

1,636,336 OPHTHALMIC MOUNTING. Daniel Pursel Bernheim, Southbridge, Massachusetts, assignor by mesne assignments to Bausch & Lomb Optical Co., Rochester, New York.

1,636,337 OPHTHALMIC MOUNTING. Frederick A. Stevens, Providence, Rhode Island, assignor by mesne assignments to Bausch & Lomb Optical Co., Rochester, New York.

1,636,340 SPECTACLE TEMPLE. James W. Welsh, Providence, Rhode Island, assignor by mesne assignments to Bausch & Lomb Optical Co., Rochester, New York.

1,636,463 OTOSCOPE. Henry L. DeZeng, Moorestown, assignor to DeZeng Standard Co., Camden, both in New Jersey.

1,636,482 VAGINAL APPLICATOR. Frank H. Newton, assignor to Duplex Dilator Corp., both of Los Angeles, California.

1,636,483 WHEEL. Hans P. Nielsen, Alameda, assignor to Eames Co., San Francisco, both in California.

1,636,494 REVERSIBLE HEEL. George A. Volz, Cincinnati, Ohio.

1,636,514 GOLF CLUB. Charles J. Jahant, assignor to The General Tire & Rubber Co., both of Akron, Ohio.

1,636,518 BASEBALL CENTER. Sharp Lannom, Jr., assignor to Lannom Manufacturing Co., both of Grinnell, Iowa.

1,636,528 STEERING COLUMN BUSHING. Fred C. Morris, San Francisco, California.

1,636,566 AIR GAGE. Frederick Godfrey Johnson, assignor to Visible Tire Gauge Co., both of New Haven, Connecticut.

1,636,606 ARMORED CABLE. Alexander O. Hoeftmann, Worcester, Massachusetts, assignor to The American Steel & Wire Co. of New Jersey.

1,636,627 COMBINATION BROOM AND DOOR HOLDER. Robert J. Craven, Battle Creek, Michigan.

1,636,655 GOLF TEE. Philip E. Young, Fairhaven, Massachusetts, assignor to Acushnet Process Co., a corporation of Massachusetts.

July 26, 1927*

1,636,720 GARTER. James R. Starbuck, Tampa, Florida.

1,636,759 CUSHION TIRE. Leon N. Southmayd, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,636,772 HEEL. Abe Golub, St. Louis, Missouri.

1,636,779 INNER TUBE. Frederick W. Krone, San Francisco, California.

1,636,780 DUPLICATOR. Edmund Lichtenstein, assignor to Deutsche Maschinenbau- und Vertriebs-Gesellschaft m.b.H., both of Berlin, Germany.

1,636,798 ATTACHMENT PLUG. Edwin C. Ballman, St. Louis, Missouri.

1,636,905 SHOE. Abram E. Falor and Frederick H. Martin, Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.

1,636,948 TIRE PROTECTOR. Hiram C. Anderson, New York, N. Y.

1,636,978 PUNCTUREPROOF PNEUMATIC TIRE. Hiram C. Anderson, New York, N. Y.

1,637,027 OVERSHOE. Walter E. Piper, Sudbury, Massachusetts.

1,637,094 PRINTING DIE. Harold R. Wade and Lee M. Harley, assignors to James H. Matthews, all of Pittsburgh, Pennsylvania.

1,637,214 ELASTIC SUSPENSION WHEEL. Denis P. J. Burguières, assignor of one-fourth to Godfrey Christ, both of Louisa, Louisiana.

1,637,219 HYDROMETER BULB. Leo Edelmann, assignor to E. Edelmann & Co., both of Chicago, Illinois.

1,637,249 COMB AND METHOD OF MAKING SAME. Butler Ames, Lowell, Massachusetts.

1,637,264 SYRINGE. Jacob Masonick, Gustav Steubner and John Steubner, Chicago, Illinois, said Masonick assignor to said Gustav Steubner.

1,637,278 GAME. George H. Renz, Newark, New Jersey.

1,637,280 PUNCTUREPROOF CUSHION WHEEL. Marcel A. Robin, Port-au-Prince, Haiti.

1,637,285 BLISTER PREVENTIVE AND FOOT PAD. Frank Sheehan, Ithaca, New York.

1,637,313 CORSET. Joseph Leonard, assignor to Fifth Avenue Corset Co., Inc., both of Allentown, Pennsylvania.

August 2, 1927*

1,637,332 QUICK DETACHABLE CAP. Adelbert E. Bronson, assignor to The Dill Manufacturing Co., both of Cleveland, Ohio.

1,637,499 TEMPORARY TIRE TUBE VALVE. George W. Rundlett, Washington, D. C.

1,637,557 BARBER'S DISPENSING BOTTLE. Roy Depue, Milford, Iowa.

1,637,567 PAVING BLOCK. Rufus F. Herrick, Winchester, Massachusetts.

1,637,570 RUNNING BOARD. Matthew Walter Huber, Chicago, Illinois, assignor to Motor Wheel Corporation, Lansing, Michigan.

1,637,599 TIRE AND RIM. James C. Ballew, Akron, Ohio.

1,637,675 HEEL. Edward G. Bloser, Jr., Philadelphia, Pennsylvania.

1,637,712 BLOWOUT BOOT. John F. Rogers, Dayton, Ohio; Albert R. Rogers administrator of said John F. Rogers, deceased, assignor to Lucy A. Rogers, Dayton, Ohio.

1,637,719 SAFETY SLIP FOR NURSING BOTTLES. Sallie Whitlock, Los Angeles, California.

1,637,753 TIRE STRUCTURE. Annie M. Lane, Los Angeles, California.

1,637,780 SEAT. Alfred Fellows Masury, as-

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Chemical patents will be found on page 323. Machinery and process patents will be found on pages 328-329.

signor to International Motor Co., both of New York, N. Y.

1,637,809 AUXILIARY SOLE FOR FOOTWEAR. John L. G. Dykes, Chicago, Illinois.

1,637,826 CORSET. Waldemar Kops, assignor to Kops Bros., Inc., both of New York, N. Y.

1,638,003 APPLIANCE FOR BODILY EXERCISE. Bruno Neumann, Nuremberg, Germany.

Dominion of Canada

July 5, 1927

272,056 BATH MAT. Frederick C. Brewer, Los Angeles, California, U. S. A.

272,076. SECTIONAL WHEEL RIM. Earl Willis Gilpatrick, Whiting, Maine, U. S. A.

272,097 TIRE RIM. Zeno Littman, New York, N. Y., U. S. A.

272,108 SOLE AND HEEL. Charles A. Morton, Bozeman, Montana, U. S. A.

272,192 MULTICORE HIGH TENSION ELECTRIC CABLE. Pirelli & Co., assignee of Luigi Emanueli, both of Bicoca Works, near Milan, Italy.

272,211 PAVING BLOCK. The Wright Rubber Products Co., assignee of Clarence Wright, both of Racine, Wisconsin, U. S. A.

July 12, 1927

272,251 TIRE RIM. Louis G. Finnicum, St. Paul, Minnesota, U. S. A.

272,304 WHEEL RIM. Thomas C. Whitehead, Detroit, Michigan, U. S. A.

July 19, 1927

272,391 TIRE RIM MOUNTING MEANS. Charles Edouard Michaud and Lucien Lapierre, both of Hull, Quebec.

272,434 PUNCHING BAG. John C. Korth, New York, N. Y., U. S. A.

July 26, 1927

272,552 CUSHION. Erwin A. Weinman and Robert C. Beach, both of Seattle, Washington, U. S. A.

272,556 GUM MASSAGING DEVICE. John A. Maker, Duluth, Minnesota, U. S. A.

272,633 VEHICLE TIRE. Otto J. Ribarsch, New York, N. Y., U. S. A.

272,650 TIRE VALVE AND DUST CAP. Mossom Walton, Ingersoll, Ontario.

272,654 CUSHION ARCH PROTECTOR SHOE. George J. Winter, Buffalo, New York, U. S. A.

272,698 APPLICATORY CAP. The Gold Dust Corp., New York, N. Y., assignee of Robert H. Van Sant, Chicago, Illinois, both in U. S. A.

272,737 STORAGE BATTERY CONTAINER. The Willard Storage Battery Co., assignee of Carl J. Dunzweiler, both of Cleveland, Ohio, U. S. A.

272,742 TIRE RIM. George B. Rooney, Fairview, Kansas, assignee of August Theodore Jackson Bahr, Kansas City, Missouri, both in U. S. A.

272,743 TIRE RIM. George B. Rooney, Fairview, Kansas, assignee of Henry Grant Baker, Kansas City, Missouri, both in U. S. A.

August 2, 1927

272,754 GASKET, PACKING, ETC. Frederick Joseph Gibbs and Cyril George Middleton, both of Liverpool, County of Lancaster, England.

272,766 BATH MAT. Frederick C. Brewer, Los Angeles, California, U. S. A.

272,801 BOW TIE EMPLOYING RUBBER. David Lazarus, Montreal, Quebec.

272,812 EXERCISING DEVICE. Bruno Neumann, Nuremberg, Bavaria, Germany.

272,850 IMITATION LEATHER. The Dominion Rubber Co., Ltd., Montreal, Quebec, assignee of Charles Hamilton, Dennison, Quincy, Massachusetts, U. S. A.

United Kingdom

June 29, 1927

270,413 VEHICLE MUDGUARDS. U. Cauchy, 41 Boulevard Gambetta, Tourcoing, France.

270,448 GILL BOXES. G. Spencer, Moulton & Co., Ltd., 2, Central Buildings, Westminster, and D. M. Proctor, Trevose, Grange Road, Bushey, Hertfordshire.

270,472 BUOYANT KNAPSACKS. M. Sändig, 50, Ohlauer Strasse, Breslau, Germany.

270,588 HAND PRINTING AND CUTTING APPARATUS EMPLOYING DETACHABLE TYPE. A. Büchi, Klosters, Switzerland.

270,688† ATHLETIC BOOT WITH RUBBER TOE CAP. E. Stahl, 44 Geibelstrasse Dusseldorf, Germany.

270,693† ELECTRIC SWITCHES. L. Thiry, 19 Rue Vankeerberghen, Huy, Belgium.

270,694† HINGES. L. Thiry, 19 Rue Vankeerberghen, Huy, Belgium.

270,716† PACKING. F. Faudi, Sömmerda, Thuringia, Germany.

270,719† DETACHABLE RIM ATTACHMENT TO WHEELS. Soc. Italiana Pirelli, 21 Via Fabio Filzi, Milan, Italy.

July 6, 1927

270,827 ELASTIC VALVES. H. P. Clemetson, Summer Hill House, Willesborough, Kent.

270,898 HORSESHOE PAD. A. Dales, Blake street, Stretford Road, Manchester.

270,923 SPINNING ROLLER. R. L. Sutcliffe, 13, Burnroyd avenue, Crosshills, near Keighley, Yorkshire, and W. A. Winder, 11, Broad street, Bradford.

270,926 AIRPLANE WINGS EMPLOYING RUBBER STRANDS. C. Masters, 72, Albert Mansions, South Lambeth Road, London.

271,011 IMITATION LEADED LIGHTS FOR WINDOWS. W. J. Riley, Eccles Motor Caravans, Ltd., Gosta Green, Birmingham.

July 13, 1927

271,151 ELASTIC FABRICS. L. Mellersh-Jackson, 28, Southampton Buildings, London (Everlastik, Inc., Chelsea, Massachusetts, U. S. A.).

271,256 RESERVOIR PENS. F. T. O'Hanlon, 104, Goldsmith street, Nottingham, and A. Pennington, 15, Murdock street, Liverpool.

271,283 STOCKING SUSPENDER. J. M. Coltman, 20, West street, Croydon, Surrey.

271,317 PNEUMATIC VEHICLE SPRINGS. C. W. Caldwell, 53, O'Reilly Road, Berea, Johannesburg, South Africa.

271,324 TIRE REPAIR DEVICE. H. J. Burney, 250, Richmond Road, London.

271,340 SHIN GUARD. J. Patten, 84 Werthauserstrasse, Duisburg, Germany.

271,415 CUTTING OUT APPARATUS EMPLOYING RUBBER. F. Mertinz, 12 Richtergasse, Vienna.

271,416† SPONGE RUBBER MATTRESS FOR CAMERA. A. Bourdereau, 262 Rue de Belleville, Paris.

271,421† PNEUMATIC TIRE PRESSURE GAGE. G. S. Loy, 24 Rue de Liege, Paris.

271,427† SURGICAL APPLIANCES. A. Von Borosini, Villa Mimosa, Cassarate, Lugana, Switzerland.

271,435† VEHICLE SPRING SUSPENSIONS. E. Bugatti, Molsheim, Bas-Rhin, France.

271,458† DEVICE FOR SECURING NIPPLES TO BOTTLES. J. Köllner-Egloff, 105 Hohlenbaumstrasse, Schaffhausen, Switzerland.

271,471† PNEUMATIC TIRE TREAD. K. L. H. Bertram, 13, Lynette Alle, Copenhagen.

271,496† GALVANIC BATTERIES. Compagnie Française Pour L'Exploitation des Procédés Thomson-Houston, 173 Boulevard Haussman, Paris.

271,497† GRAMOPHONE WITH ENDLESS RUBBER BAND. H. Küchenmeister, 1 Furtherstrasse, Berlin, Germany.

271,499† MERCURY VAPOR RECTIFIERS. General Electric Co., Ltd., Magnet House, Kingsway, London, and E. Weintraub, 14 Rue des Marronniers, Paris, assignees of Soc. Alsacienne des Constructions Mécaniques.

July 20, 1927

271,559 HEEL GRIP AND LINING. G. and G. E. Bennett, 13, Mount Road, Mitcham, Surrey.

271,621 GOLF BALL CLEANER. J. E. Graham, The Châlet, Gipsy Lane, Putney, London.

271,635 ELECTRIC STORAGE BATTERIES. C. E. Linebarger, 3845 Ravenswood avenue, Chicago, Illinois, U. S. A.

271,650 LAY FIGURE COVERS. W. Redhouse, 10, Warwick street, London.

271,655 FOOT ARCH SUPPORTS. C. E. Lacey, 45, Newhall street, Birmingham.

271,686 TOBACCO PIPE CLEANER. C. de M. Murray, 1512 Beach Drive, Victoria, British Columbia.

271,689 HOSE SUSPENDERS. D. Beeck, 9 Paradiesstrasse, Breslau, Germany.

271,696 HOSE COUPLING. F. W. Bolt, Royal Hotel, Krugersdorf, Transvaal, South Africa.

271,720 WINDOW STOPS. W. Willicombe, 176, Habershon street, Cardiff.

271,763 SPRING WHEEL. B. Höfer, Vyskov, Czecho-Slovakia.

271,795 FILLER BETWEEN BOOT SOLE AND INSOLE. A. Burton and A. C. York, 60, Colton street, Leicester.

271,810† GRAMOPHONE TRANSMISSION SYSTEM. Western Electric Co., Inc., New York, assignee of H. C. Harrison, Port Washington, both in New York, U. S. A.

271,857† BREAST PUMP. L. I. G. Sales, 12 Rue Perchepinte, Toulouse, Haute Garonne, France.

271,861† SPRING WHEEL. Soc. le Telesco, 12 Boulevard Péreire, Paris, France.

New Zealand

June 2, 1927

57,717. MEDICAL APPLIANCE. Sydney Levy, Jr., P. O. Box 78, Suva, Fiji Islands.

58,134 TIRE TREAD. The Goodyear Tire & Rubber Co., assignees of Harold Ashcroft Brittain, both of Akron, Ohio, U. S. A.

June 16, 1927

58,350 RESILIENT VEHICLE WHEEL. John Joseph Charley, Dorset Road, Croydon, near Melbourne, Victoria.

Germany

446,716 SUSPENDERS. Nicolas de Stempel, Courbevoie, Seine, France. Represented by Hans Heimann, Berlin S. W. 61.

446,758 HEEL OR SOLE. Moritz Berger and Julius Lindner, Vienna. Represented by W. Zimmermann and E. Jourdan, Berlin S. W. 11.

446,896 BALLOON TIRE. The Dunlop Rubber Co., Ltd., London. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, and M. M. Wirth, of Frankfurt, a. Main, and T. R. Koehnhorn and E. Noll, Berlin, S. W. 11.

447,211 RUPTURE BAND. George Fowler, Liverpool, England. Represented by M. Auerbach, Berlin S. W. 11.

447,262 PESSARY. Dr. Theodor Mietens, Edenkoben, Rheinpfalz.

France

617,781 INNER TUBE VALVES. Societe Nouvelle des Etablissements Bardin, Renard, et Couche.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

July 5, 1927, Act of February 20, 1905

229,610 APARA—garters. William D. Baer, Detroit, Michigan.

229,620 SKULL—golf balls. The Draper-Maynard Co., Plymouth, New Hampshire.

229,627 MARTIN — waist belts, suspenders, garters, etc. Martins-Birmingham, Ltd., Birmingham, England.

229,634 Fancy monogram: LT—shoes of leather,

† Not yet accepted.

cloth, and rubber, etc. Lord & Taylor, New York, N. Y.

229,655 LOCK-KNOT—wide elastic webbing. Kops Bros., Inc., New York, N. Y.

229,791 Representation of a garter containing the word: MIRACLE—garters. Justus Collins, Charleston, West Virginia.

229,806 FLEXRITE—tire patches. KeHawKe Manufacturing Co., Minneapolis, Minnesota.

229,831 The word: DURO GLOSS enclosed within a fancy square—raincoats. J. C. Haartz Co., New Haven, Connecticut.

July 5, 1927, Act of March 19, 1920

229,868 DOUBLE CUSHION—tires. The Firestone Tire & Rubber Co., Akron, Ohio.

229,869 Representation of a rubber heel containing the words: PATAGONIA, MM. COMODO Y BUENO and MADE IN U. S. A.—heels. Casa Anchorena, Inc., New York, N. Y.

229,884 ASBESTOS POWDER—pulp made of ground, pulverized and powdered and prepared talc for use as a filler in the preparation and making of rubber, soap, varnish, etc. Union Talc Co. of Gouverneur, New York and Gouverneur, N. Y.

229,887 ASBESTOS PULP—pulp made of ground, pulverized and powdered and prepared talc for use as a filler in the preparation and making of varnish, rubber, soap, etc. Union Talc Co. of Gouverneur, New York and Gouverneur, N. Y.

July 12, 1927, Act of February 20, 1905

229,948 SLEETOR—windshield wipers. The Ludden-Burton Co., Worcester, Massachusetts.

229,960 Fancy oblong containing the word: VALCLAR—bibs, baby pants, bathing caps and shoes, etc. Kase-Quinby Rubber Co., Inc., New York, N. Y.

229,967 RUBBER-VAR—semi-liquid floor polish for rubber floors. Continental Chemical Corporation of Illinois, Watseka, Illinois.

229,976 Shield containing the letter: F—footwear. Firestone Footwear Co., Hudson, Massachusetts.

229,993 TROJAN—prophylactic rubber articles for the prevention of contagious diseases. Youngs Rubber Corp., Inc., New York, N. Y.

230,044 MORCO—tires and inner tubes. The Mohawk Rubber Co., Akron, Ohio.

230,076 Representation of a baseball containing the word: REACH—football bladders, etc. A. J. Reach Co., Philadelphia, Pennsylvania.

230,078 Representation of two soldiers, between the soldiers the words: TRICO VISIONALL—windshield cleaners. Trico Products Corp., Buffalo, New York.

230,084 BONEDRY—raincoats. Sol W. Katz & Co., Philadelphia, Pennsylvania.

July 12, 1927, Act of March 19, 1920

230,187 RIGHT—paper and rubber washers, etc. Ethel S. Wagenseller, Philadelphia, Pennsylvania.

July 19, 1927, Act of February 20, 1905

230,208 WHITE MULE—tire patches. White Mule, Inc., Carbondale, Illinois.

230,216 RELIANCE—belting and packing. Pioneer Rubber Mills, San Francisco, California.

230,313 Circle containing the words: R. T. VANDERBILT CO., N. Y., LONE STAR CLAY, and AMERICAN PRODUCTS—clay used as a filler in the manufacture of paper, paints and rubber products. R. T. Vanderbilt Co., Inc., New York, N. Y.

230,314 Circle containing the words: R. T. VANDERBILT CO., N. Y., PYRAX, and AMERICAN PRODUCTS—pyrophyllite or talc used as a filler in the manufacture of paper, paints and rubber products. R. T. Vanderbilt Co., Inc., New York, N. Y.

230,378 AMPAR—crude rubber. Continental Rubber Co. of New York, New York, N. Y.

230,392 JYNX—tire puncture antideflator compound. The Jynx Co., Alexandria, Virginia.

July 19, 1927, Act of March 19, 1920

230,408 AER SEAL—puncturepreof tire liquid. Aer-Seal Manufacturing Co., Fort Wayne, Indiana.

230,409 BRISTOL—tires and inner tubes. Kokomo Rubber Co., Kokomo, Indiana.

230,437 AMERICAN—toothbrushes. Rubber & Celluloid Products Co., Newark, New Jersey.

230,448 HUDSON—hoof pads. Dryden Rubber Co., Chicago, Illinois.

230,449 PERRY—hoof pads. Dryden Rubber Co., Chicago, Illinois.

230,450 KILDARE—hoof pads. Dryden Rubber Co., Chicago, Illinois.

July 26, 1927, Act of February 20, 1905

230,462 LUCKY DOG—golf balls. The Draper-Maynard Co., Plymouth, New Hampshire.

July 26, 1927, Act of March 19, 1920

230,550 QUIK STIK—patches. Frederick H. Rogers, doing business as Quik-Stik Rubber Works, Chicago, Illinois.

August 2, 1927, Act of February 20, 1905

230,588 PE-KO—jar rings. United States Rubber Co., New Brunswick, New Jersey, and New York, N. Y.

230,600 SONA—fabric with cotton fiber base compressed by heated cylinders and impregnated with a rubber compound. Nina Larrey Duryea, New York, N. Y.

230,606 T.I.E.D.—pneumatic tires, rubber and canvas belting. Gash-Stull Co., Chester, Pennsylvania.

230,719 BAYONET—wide elastic webbing. The Ansonia O. & C. Co., Ansonia, Connecticut.

230,797 SNUG-RUG—lap rugs. I. B. Kleinert Rubber Co., New York, N. Y.

August 2, 1927, Act of March 9, 1920

230,839 VERILITE—elastic hosiery. Horn Surgical Co., Philadelphia, Pennsylvania.

230,842 JOHNSON'S—puncture proof compound for pneumatic tire. Waldo P. Johnson, Paris, Texas.

Dominion of Canada

Registered

July 5, 1927

41,718 Words: "DOMINION ROYAL"—goods made of rubber and rubber composition. Dominion Rubber Co., Ltd., Montreal, Quebec.

July 26, 1927

41,786 GAYTEES—boots and shoes. Dominion Rubber Co., Ltd., Montreal, Quebec.

August 2, 1927

41,835 FIRMITE—asbestos, rubber, and asbestos and rubber packing. Canadian Asbestos Co., Montreal, Quebec.

41,846 Rectangle bearing the word: HELSINBORG, cut by a circle bearing a representation of three turrets—boots, balls, toys, tires, tubes, air beds, etc. Helsinborgs Gummifabriks Aktiebolag, Helsingborg, Sweden.

41,849 Letters: "M S W", of unequal height enclosed within a diamond shaped border, rubber stamps, accessories, etc. Montreal Stencil Works, Ltd., Montreal, Quebec.

41,850 Word: "RED-FLEX"—belts, belting, hose, tubing, heels, tire casings, patches, etc. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario.

41,854 Word: "ROMEX"—insulated electric wire and cable. Rome Wire Co., Rome, New York, U. S. A.

United Kingdom

June 29, 1927

478,036 LEYLAMAC—waterproof articles of clothing. The Leyland & Birmingham Rubber Co., Ltd., Golden Lane, Leyland, near Preston, Lancashire.

478,058 RAINY DAYSEE—hat cover. Evernu Rubber Heel Corp., New York, N. Y., U. S. A. (Frank Dehn, Kingsway House, 103, Kingsway, London, W. C. 2).

480,080 META-REST—foot arch supports. The Scholl Manufacturing Co., Ltd., 38 Granville Square, London, W. C. 1.

480,112 ZAC—rain and waterproof clothing. Henry Osborn King, trading as Zacharias & Co., 26 Cornmarket street, Oxford.

481,101 HIMEGITE—goods manufactured from rubber and gutta percha. Thomas de la Rue & Co., Ltd., 110, Bunhill Row, London, E. C. 1.

July 6, 1927

471,574 SALTAIR—surgical appliances. Salt & Son, Ltd., 5 Cherry street, Birmingham.

481,143 MATTA-WARM—rubber and gutta percha goods. Pearson Bros., 45, Conduit street, Bond street, London, W. 1.

July 13, 1927

476,588 Representation of a knight on horseback, beneath the representation the word: SAXON—tires and inner tubes. India Tire & Rubber Co., Mogadore, Ohio, U. S. A. (White, Langner, Stevens & Parry, Jessel Chambers, 88, Chancery Lane, London, W. C. 2.).

480,556 VULCAFIX—all goods included in Class 40. The Dunlop Rubber Co., Ltd., Fort Dunlop, Holly Lane, Erdington, Birmingham.

July 20, 1927

478,075 USMC—goods manufactured from rubber and gutta percha. The British United Shoe Machinery Co., Ltd., Union Works, Belgrave Road, Leicester.

481,079 NOMET—electric cables. W. T. Henley's Telegraph Works Co., Ltd., 11, Holborn Viaduct, London, E. C. 1.

481,486 OLONITE—electric cables. The Greenwich Cable Works, Ltd., 97, Dashwood House, Old Broad street, London, E. C. 2.

Designs

United States

73,004 TIRE. Term 14 years. Horace Mann, Albuquerque, New Mexico.

73,046 GOLF BALL. Term 14 years. Albert Ernest Penfold, assignor to The Dunlop Rubber Co., Ltd., Fort Dunlop, both in Birmingham, England.

73,139 OVERSHOE. Term 14 years. Frederick H. Martin, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

73,143 SHOE SOLE. Term 14 years. Laurence M. Oakley, Trenton, New Jersey.

73,147 BULB FOR HYDROMETER SYRINGE. Term 7 years. William A. Reynolds, assignor to The Ohio Rubber Co. both of Cleveland, Ohio.

73,168 TIRE. Term 3½ years. Fred D. Fowler, Watertown, Massachusetts.

73,169 TIRE TREAD. Term 14 years. Wade S. Galvin, Akron, Ohio.

73,173 PNEUMATIC TIRE TREAD. Term 7 years. Percy Graham, Chicago, Illinois.

Dominion of Canada

7,614 GOLF BALL. The India Rubber Gutta Percha & Telegraph Works Co., Ltd., 106, Cannon street, London, England.

Germany

993,968 BALLOON WITH ANCHOR FIGURE. Karl Kluge, Annaberg i. Erzgeb.

994,310 HEEL. Hermann Regeniter, Jagerstrasse 9, Elberfeld.

994,325 OVERSHOE. Albin Benndorf, Pausa, i. V.

994,541 BLADDER WITH VALVE SO ARRANGED INTERNALLY THAT IT CAN BE PRESSED OUT. Harburger Gummiwaren-Fabrik Phoenix A. G., Hamburg a. d. Elbe.

994,743 UNIFORMLY FITTING DOUBLE PROTECTIVE COVER OF HARD RUBBER OR THE LIKE ON METAL TUBES AND SIMILAR OBJECTS. Dr. Heinr. Traun & Sohne, vormals Harburger Gummi-Kamm Co., Meyerstrasse 59, Hamburg, 8.

995,405 COLORED RUBBER SHIELD FOR RUBBER OBJECTS. Continental Caoutchouc-und-Gutta Percha-Campagnie, Hannover.

995,525 TUBE CONDUCTION. Siemens-Schuckertwerke, G. m. b. H. Berlin-Siemensstadt.

995,744 TOOTHBRUSH WITH RUBBER PINS. Friedrich Huber, Beinstein a. d. Rems, Wurttbg.

995,758 HOSE CONNECTION CONSTRUCTED AS PROTECTOR. Christian Hoings, Castrop i. w.

995,821 RUBBER IMPREGNATED ELASTIC THREAD. Hageda, Handelsgesellschaft Deutscher Apotheker A. G., Dortmunderstrasse 12, and Wilhelm Sponholz, Nurnberger Platz 5, Berlin.

995,924 WHEEL COVER. Continental—Caoutchouc-und Gutta Percha Campagnie, Hannover.

996,012 SHIRRED BAND SPECIALLY DESIGNED FOR GARTERS. Emil Hoppmann, Kreuzstrasse 70, Adolf Zarth, Schwelmerstrasse 156, and Erich Wedding, Rauentalerstrasse 7, Barmen.

996,031 VACUUM CUPS USED TO ATTACH TOILET MIRRORS TO WALLS OR GLASS PLATE. Leiter & Ullmann, Johannisstrasse 146c, Nurnberg.

A Tubing Machine for Striped Tubing

The ordinary tubing machine is limited by design to extrude only one stock at a time although unlimited as to the variety of shapes in which its products may be formed by dies.

A recent interesting development in tubing machines is one by which it is possible to extrude strips of stock in two colors or two qualities and combine them into a perfect tube with the different colors or qualities in parallel or spiral relation.

The principal features wherein this machine differs from an ordinary tube are that it has two cylinders, one for each color or quality of stock each containing two worms or screws for forcing the stock to a single nozzle of compound construction to which

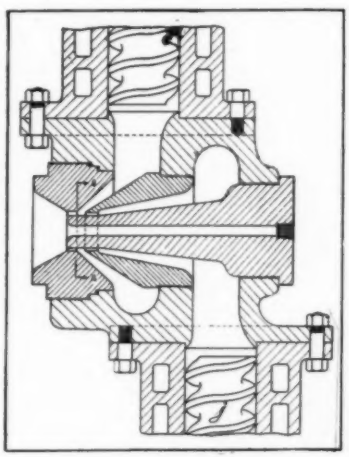


Diagram of Tubing Machine Head and Die for Delivering Colored Strips in Tubular Form.

dies are fitted to produce a single tube. Each worm is actuated through gearing, the speed of which can be independently varied to suit requirements.

The stocks enter the head from opposite sides, reaching the die through independent passages and issuing as separate parallel strips. These unite into a tube as they are compressed by their passage through the die. The colored strips may be assisted to assume a spiral position by means of a mandrel or core within the tube and having both a rotary and an endwise movement.

Rubber tubing may be formed with a lining of hard rubber and an outer covering of soft rubber, or vice versa, or with a lining of one color and the covering of another. When the outer covering is made from strips they may vary in color and give a pattern effect.

Thus with a machine of this sort tubed products can be made in a greater range of usefulness and design unobtainable by ordinary tubing machine facilities.

SENATOR STUDIES PHILIPPINE RUBBER

A first-hand study of rubber was made recently by United States Senator Burton K. Wheeler on the island of Basilan, from which is exported practically all the rubber produced in the Philippine archipelago. Landing at Isabela and accompanied by Major Fletcher, U. S. A., he was received by Manager W. Boelsterli of the Basilan Plantation Co., and was shown every phase of rubber production, including jungle-clearing, planting, tapping, coagulating, milling, drying, and finally boxing crepe sheets. Later the senator was taken about five miles to Latuan, where Assistant Manager J. P. Mankin took him over the American Rubber Co. estate and explained all the processes for producing smoked sheet. Dr. J. W. Strong, manager, and noted rubber authority, had arranged to meet the senator, but unluckily missed the boat plying over the 15-mile strait from Zamboanga. With the senator were Mrs. Wheeler and their three children.

United Kingdom Rubber Statistics

IMPORTS

	June, 1927		Six Months Ended June, 1927	
UNMANUFACTURED				
Crude Rubber From—	Pounds	Value	Pounds	Value
Straits Settlements	8,470,600	£647,543	69,223,300	£5,631,654
Federated Malay States	5,133,300	398,123	34,291,600	2,776,655
British India	737,000	58,314	7,161,500	583,537
Ceylon and Dependencies	2,200,600	174,350	19,991,600	1,610,494
Other Dutch possessions in Indian Seas	1,161,800	88,741	13,230,900	1,077,359
Dutch East Indies (except other Dutch possessions in Indian Seas)	3,088,000	244,357	16,934,800	1,389,147
Other countries in East Indies and Pacific not elsewhere specified	215,900	17,984	1,267,500	103,355
Brazil	43,700	2,507	6,501,100	414,274
Peru	24,600	1,498	27,300	1,702
South and Central America (except Brazil and Peru)	.....	.....	123,600	9,112
West Africa:				
French West Africa	3,900	205	119,800	6,659
Gold Coast	37,700	2,660	300,000	21,855
Other parts of West Africa	92,200	7,272	783,200	61,361
East Africa, including Madagascar	37,100	2,980	681,700	52,674
Other countries	290,700	22,439	887,700	67,415
Totals	21,537,100	£1,668,973	171,525,600	£13,807,253
Waste and reclaimed rubber	847,000	12,072	3,740,900	59,386
Gutta percha and balata	498,500	44,489	2,960,200	267,254
Rubber substitutes	7,900	198	86,300	3,592
Totals	22,890,500	£1,725,732	178,313,000	£14,137,485
MANUFACTURED				
*†‡Tires and tubes Pneumatic				
Outer covers	.....	£119,506	.....	£1,930,190
Inner tubes	.....	16,231	.....	240,013
Solid tires	.....	5,473	.....	115,080
Boots and shoes....*doz. pairs*	37,943	54,135	241,253	381,151
Other rubber manufactures	.....	133,221	.....	865,268
Totals	.....	£328,566	.....	£3,531,702

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	1,808,400	£18,418	13,763,800	£139,743
Rubber substitutes	37,300	913	329,700	7,674
Totals	1,845,700	£19,331	14,093,500	£147,417
MANUFACTURED				
*‡Tires and tubes Pneumatic				
Outer covers	.....	£233,578	.....	£1,622,182
Inner tubes	.....	45,651	.....	344,771
Solid tires	.....	31,548	.....	194,095
Boots and shoes....*doz. pairs*	18,280	28,444	113,102	174,525
Other rubber manufactures	.....	245,950	.....	1,454,499
Totals	.....	£585,171	.....	£3,790,072

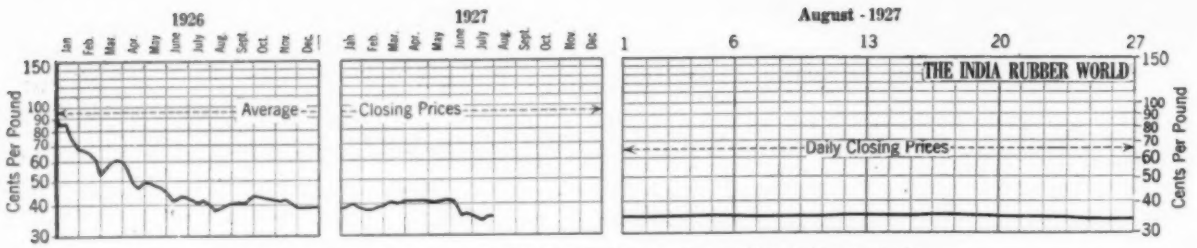
EXPORTS—COLONIAL AND FOREIGN

	June, 1927		Six Months Ended June, 1927	
UNMANUFACTURED				
Crude Rubber To—	Pounds	Value	Pounds	Value
Russia	3,373,300	£288,344	15,366,100	£1,445,186
Sweden, Norway and Denmark	158,700	14,928	1,082,100	99,944
Germany	3,146,600	264,808	14,761,400	1,197,185
Belgium	632,000	52,176	3,017,300	233,222
France	2,578,400	211,281	10,471,200	852,476
Spain	73,600	6,346	554,600	43,842
Italy	965,100	78,351	5,398,300	465,665
Other European countries	335,200	32,203	1,714,800	157,218
United States	5,089,300	420,943	29,143,000	2,347,002
Canada	2,400	179	35,800	3,327
Other countries	70,500	6,817	412,000	38,484
Totals	16,425,100	£1,376,376	81,956,600	£6,883,551
Waste and reclaimed rubber	53,900	£1,499	162,600	£4,283
Gutta percha and balata	40,000	3,403	353,000	34,040
Rubber substitutes	2,200	157	8,700	397
Totals	16,521,200	£1,381,435	82,480,900	£6,922,271
MANUFACTURED				
*†‡Tires and tubes Pneumatic				
Outer covers	.....	£5,080	.....	£288,325
Inner tubes	.....	1,055	.....	40,092
Solid tires	.....	690	.....	7,570
Boots and shoes....*doz. pairs*	894	1,471	7,836	17,574
Other rubber manufactures	.....	8,268	.....	50,373
Totals	.....	£16,564	.....	£403,934

* On and after April 12, 1927, rubber tires and tubes imported or exported with and forming part of the equipment of complete vehicles or of chassis, or fitted to wheels imported separately, are included under complete vehicles or parts, respectively.

† Motor cars, motorcycles, and parts and accessories thereof, liable to duty from September 29, 1915, until August 1, 1924, inclusive, and on and after July 1, 1925. Commercial vehicles, etc., and parts and accessories thereof were, however, exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes for motor cars and motorcycles until April 11, 1927, inclusive.

‡ Included all tires and tubes prior to April 12, 1927.



Rat'o Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York Outside Market

THE general state of dullness which has characterized the outside crude rubber market for some months past continued during August as regards operations by dealers and purchasers of rubber by consumers. The general sentiment that there is in sight an excess of rubber available for the world's manufacturing needs of 1927 is based on estimates such as the following:

Standard production for Malaya is 333,000 tons, for Ceylon 73,000 tons, a total for both countries of 406,000 tons. In the current restriction year, ending October 31, 1927, there is being exported for the first three months 80 per cent, for the second three months 70 per cent, and for the last six months 60 per cent. This is an average for the restriction year of 67½ per cent of standard for Malaya and Ceylon, or 275,000 tons. To this is to be added unrestricted production as follows: Dutch East Indies, 221,000 tons; on unused coupons as of November 1, 38,000 tons; from the plantations of India, Burma and British North Borneo, 40,000 tons; wild rubber from Brazil, 25,000 tons; wild rubber from other countries, 12,000 tons.

The total from all these sources is 611,000 tons. Against this total the world's consumption is estimated at 580,000 tons, of which that of America is 390,000 tons and that of the rest of the world is 190,000 tons. There is thus a surplus of 31,000 tons.

In view of this condition rubber manufacturers have all summer been restricting their purchases to current needs without fear of a rise in the prices of crude. The larger companies purchase their requirements abroad or in the primary markets under favorable financing while the others purchase in New York. There was very little trading between dealers and dullness characterized the market for spot because the factories generally are content with fair to moderate supplies.

Receipts of rubber for July were 1,580 tons less than for June. But for the 7 months ended July 31, the total receipts exceeded that of the corresponding period of last year by 18,654 tons and reflects a proportionately heavy increase in this year's rubber consumption.

During the week closing July 31 market conditions were very dull. The price of spot ribbed smoked sheets closed on Monday at 35 cents and held at that level all the week. There was very little interest on the part of factory purchasing agents. Such spot business as appeared went direct to the large dealers or the pool without effect upon the market. Dullness also prevailed in the London and eastern markets with slight price changes from day to day.

The week terminated August 6 exhibited a certain amount of underlying strength due to firmer foreign cables and some trade buying. The price rose to 35½ cents at the week end. A fair demand was forthcoming on the part of the factories but these inquiries as a rule ran from ½ to ¼ cent under the prevailing prices and did not result in many sales. The foreign markets held firm, supported by the belief that as fall approaches the consuming demand will improve and better prices may be realized. A sharp rise is not anticipated but an upward trend is expected.

The market of the week ended August 13 showed a slight stiffening of prices at the beginning with dealers covering their short positions and picking up most of the c. i. f. offers from the Far East. During the week spot ribs rose 1 cent to 36¼ cents. The factories were rather conservative. They were not seeking rubber and bought only small amounts. They kept a close watch on the market however.

The week ended August 20 revealed some factory inquiry at figures under the ruling prices. In general the market was dull. Towards the end of the week prices eased off to 35¼ cents, ⅜ down from the first of the week. This was not enough to stimulate buying. The decline was thought to be an attempt on the part of dealers to bring about a decline in the primary markets to secure cheaper offers. The foreign markets held firm, however.

The week ended August 27 was dull. Prices declined ½ to ¾ cents all around becoming steadier at the close. The market is expected to rule quiet until September when factory buying interest will be revived.

Importations of all grades in July were 38,667 tons, compared with 37,087 tons one year ago. Plantation arrivals for July were 37,060 tons, compared with 35,537 tons one year ago. Total importations of plantation rubber for seven months ended July 31, were 249,168 tons, compared with 230,514 tons for the corresponding period of 1926. Total importations of all grades of rubber for the seven months ended July 31 were 265,517 tons, compared with 245,724 tons for the corresponding period of 1926.

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

PLANTATIONS	July, 1927						August, 1927																	
Sheet	25	26	27	28	29	30	1	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19	20
Ribbed smoked	35	35	34⅞	34⅞	35	35	35	35	35⅛	35⅛	35⅜	35½	35¼	35⅜	35⅞	35⅞	36	36¼	35⅜	35½	35⅝	35½	35⅜	35¼
Crepe																								
First latex	35	35	34⅞	34⅞	35	35	35	35	35⅛	35⅛	35⅜	35½	35⅜	35⅜	35⅞	35⅞	36⅛	36⅛	35¾	35⅝	35⅝	35½	35⅜	35¼
No. 2 blanket	32	31⅞	31⅞	31¾	31⅞	32	32	31⅞	31¾	32⅛	32⅜	32	31⅞	32⅛	32¼	32⅛	32⅜	32⅜	32⅛	32⅛	32¼	32¼	32	32
No. 3 blanket	31⅜	31⅜	31⅜	31⅜	31½	31⅜	31⅜	31½	31½	31⅝	31¾	31½	31¼	31⅜	31¾	31¾	32	32¼	31⅝	31¾	31¾	31⅝	31½	31½
No. 4 blanket	30⅝	30½	30½	30⅝	30⅝	30⅝	30⅝	30½	30½	30⅞	30⅞	30⅝	30⅜	31	31¼	31¼	31¼	31½	31⅛	31	31⅛	30⅞	30¾	30¾
Thin clean brown	31⅛	31½	31½	31⅜	31½	31¾	31⅜	31½	31⅝	31⅝	31⅞	31½	31⅝	32	32	32	32¼	32¼	31⅞	31⅞	32	31¾	31¾	31⅝
Rolled brown	28	27¾	28	28	28¼	28	28¼	28	28	28½	28⅜	28⅜	28¼	28½	28½	28¾	28⅝	28⅞	28⅝	28½	28¾	28½	28⅛	28⅜
Off latex	34½	34⅜	34⅜	34⅜	34½	34½	34⅜	34½	34⅝	34¾	35⅛	35	34¾	35⅛	35⅜	35⅜	35½	35¾	35¼	35	35¼	35	34¾	34¾

New York Quotations

Following are the New York spot and future rubber quotations for one year ago, one month ago and August 25, the current date:

Plantation Hevea	August 25, 1926	July 25, 1927	August 25, 1927
Rubber latex (Hevea)....*gal.*	$1.80 @	$1.50@	$1.50@
CREPE			
First latex, spot	.40¼@	.35⅛@.35¼	.35⅛@.35¼
September	.40¼@.40½	.35¼@	.35⅛@
August-September	.40½@	.35¼@	.35⅛@.35¼
October-December	.40½@.40¾	.35½@	.35⅜@
January-March	.41¾@.42½	.36 @	.36 @.36⅛
January-June	.43 @.43½	@	.36½@
Off latex, spot	.40 @.40½	.34¼@	.34¾@
Amber No. 2, spot	.39 @.39½	.32 @	.31 @
September	.37½@	.32 @	.31⅛@
August-September	.38½@	.32 @	.32 @
October-December	.38¾@	.32¼@	.32¼@
January-March	.40½@	.32½@	.33 @
January-June	@	@	@
Amber No. 3, spot	.38½@.39	@	.30½@.30¾
Brown, thin, clean	.37½@.38½	.31 @	.30½@.31
Brown, specky	.37 @.37½	@	.30¾@
Brown, roll	.35 @.35½	.28 @	.28 @.28¼
Sole crepe	.60 @	@	@
Sheet			
Ribbed, smoked, spot	.40 @.40¼	.34⅞@.35	.34⅞@.35
September	.40 @.40¼	.35 @	.34⅞@
August-September	.40¼@	.35⅛@	.34⅞@.35
October-December	.40½@.40¾	.35¼@.35½	.35¼@.35⅜
January-March	.41½@.42	.35½@.35¾	.36 @
January-June	.42½@.43½	@	.36½@
East Indian			
PONTIANAK			
Banjermassin	.16¼@	.09¾@	.07 @
Pressed block	.27½@.28½	.16 @	.14 @
Sarawak	.16¼@	.09¾@	.07 @
South American			
PARAS			
Upriver, fine	.40 @	.30¾@	.30¾@
Upriver, fine	*.54 @	*.40½@	*.39½@
Upriver, medium	@	@	.26 @
Upriver, coarse	.25½@	.20¼@	.20 @
Upriver, coarse	*.39 @	*.31 @	*.32 @
Islands, fine	.36 @	.28 @	.28 @
Islands, fine	*.50 @	*.37½@	*.38 @
Acre, Bolivian, fine	.41 @	.31 @	.31 @
Acre, Bolivian, fine	*.54 @	*.40½@	*.40 @
Beni, Bolivian	.41 @	.31 @	.31 @
Madeira, fine	.41 @	.30½@	.30¾@
Peruvian, fine	.39 @	.28½@	.30¼@
Tapajos, fine	.38 @	.28 @	.29 @
CAUCHO			
Upper Caucho ball	.26 @	.21 @	.20½@
Upper Caucho ball	*.39 @	*.31 @	*.32 @
Lower Caucho ball	.25 @	.19 @	.18½@
Maniçobas			
Ceará negro heads	†.35 @	.22 @	.22 @
Ceará scrap	†.18 @	.12 @	.12 @
Maniçoba, 30% guaranteed	†.34 @	.21 @	.21 @
Mangabiera, thin sheet	†.38 @	.21 @	.21 @
Centrals			
Central scrap	.25 @	.19½@.20	.20 @.21
Central wet sheet	.20 @	.16 @.17	.14 @.16
Corinto scrap	.25 @	.19½@.20	.20 @.21
Esmeralda sausage	.25 @	.19½@.20	.20 @.21
Guayule			
Duro, washed and dried	.32 @	.30 @	.29 @
Gutta Percha			
Gutta Siak	.32¾@	.22 @.22½	.23 @
Gutta Soh	.30 @	@	@
Red Macassar	3.00 @	2.50 @3.00	3.00 @
Balata			
Block, Ciudad Bolivar	.55 @	.34 @.36	.37 @
Columbia	.50 @	.34 @.35	.37 @
Manaos block	@	.25 @.27	.41 @
Panama	.50 @	.33 @.34	.37 @
Surinam, sheet	.75 @	.54 @.57	.57 @
amber	.80 @	.58 @.60	.60 @
Chicle			
Honduras	‡.65 @	‡.67 @	‡.67 @
Yucatan, fine	‡.65 @	‡.67 @	‡.67 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

Low and High New York Spot Prices

		August		
PLANTATIONS	1927*	1926	1925	
First latex crepe	$0.34⅞@$0.36¾	$0.37 @$0.41½	$0.71 @$0.99	
Smoked sheet, ribbed	.34¾@ .36½	.37½@ .41¼	.64 @ .99	
PARAS				
Upriver, fine	.29½@ .30¾	.37 @ .41½	.69 @ .93	
Upriver, coarse	.19½@ .20¼	.22 @ .27	.46 @ .63	
Islands, fine	.26½@ .27½	.35 @ .38½	.59 @ .80	
Cametá	.....	.21 @ .22½	.36 @ .46	

*Figured to August 20, 1927.

RUBBER AFLOAT TO THE UNITED STATES

Week Ended	British Malaya	Ceylon	East Indies	London and Liverpool	Totals
July 30	4,215	657	1,342	315	6,529
Aug. 6	3,205	650	1,884	320	6,059
Aug. 13	3,955	825	1,646	112	6,538
Aug. 20	3,981	582	1,007	678	6,248

London

Crude rubber market conditions in London during August practically duplicated those in New York. There was a slow and steady trend upward of the price of spot ribbed smoked sheets from 17 pence on August 2 to 17⅞ pence on August 12.

The market became dull on reports of decreased American consumption and the price gradually declined for the most part and from the 20th to the 24th was steady at 17⅜ pence.

The following is of interest as stating the position of the British authorities regarding the continuance of the Stevenson Plan of restriction.

Mr. Amery, the Secretary of State for the Colonies, when asked in Parliament, whether in view of the increased production of rubber outside the restriction area, and of the recent fall in the price, he was contemplating the withdrawal or modification of the restriction scheme, replied, "No, Sir, in present circumstances I do not contemplate either the withdrawal of the scheme or any alteration in the pivotal price on which it is based or any other substantial variation in its provisions. If any change in the scheme were to become necessary I should endeavor to give as long notice as possible. I shall certainly adhere to this undertaking in regard to any minor improvements in the working of the scheme which may be considered desirable as the result of experience, but so long as the conditions under which the present scheme is operating remain substantially the same, I do not propose to suggest any material modification in its provisions. I am not aware that any such alteration has taken place in those conditions in the interval."

London stocks increased 2,023 tons between July 30 and August 20. The weekly record is as follows: July 30, 63,626 tons; August 6, 64,177 tons; August 13, 64,557 tons; August 20, 64,842 tons.

Singapore

The general conditions of the rubber market from the first to the twenty-fourth of August were dull and quiet. On August 1 the spot price was 16⅞ pence. From this figure the price dropped to 16¾ pence where it remained for several days advancing on August 12 to 17⅛ pence due to some consumer demand. There was no recession from this figure until August 19 when a decline brought it to 16⅞ pence around which level it held up to August 25.

The value of restriction continues to be debated locally. The absence of favorable price reaction under the influence of the periodic cuts in exportable quantities has strengthened those opposed to restriction. While the advocates of restriction say that the Stevenson Plan is primarily for the protection of the industry and of British supremacy in rubber production, the actual producers and traders see its main value as a means of high prices and wealth for planters not subject to the scheme.

The Singapore *Free Press* in an editorial against restriction March 18, 1927, said in part as follows:

The scheme is becoming a burden which we can not shake off although it is slowly but surely wearing us out so that we are dropping behind in the race. We have never believed that the plan was good economic policy nor do we now, but even if it be claimed that we are wrong or that the industry is so mired now that it is impossible to get out on to firm ground except very slowly, it is desperately disappointing to find that with all the indications there have been of unsatisfactory results the industry has still failed to get together and to fight its own battles. It remains content with a feeble dependence upon Government and does little more than quarrel decorously at intervals when the suggestion is made that it

should help itself. It may be argued that restriction by the industry would involve the same economic fact as restriction by Government, but of this we are assured, that if restriction had been undertaken by the industry it would have been infinitely more attentive to the straws which show the way the wind is blowing than has been the case under the arbitrary system in force.

Restriction can not perhaps be thrown over now at a moment's notice; we have come to depend upon it far too much for that, but can not the industry even now make some genuine effort to show that it has sufficient business capacity within its bounds to devise a scheme for fighting the battles of commerce, instead of allowing itself to sink into an enfeebling decrepitude clinging to a government support?

The Rubber Exchange of New York, Inc.

Transactions on the Rubber Exchange between July 25 and August 24 inclusive, amounted to 8,843½ contracts equivalent to 22,106¼ long tons. The high and low fluctuations of the market were very moderate, not exceeding 1 cent and averaging less. The operations week by week were marked by dullness or only moderate activity.

During the week terminating July 30 trading was exceedingly quiet and in the small trading, prices eased off slightly. The closing price for August position on July 25 was 34.7 cents bid and on July 30, 34.9 cents nominal. The more distant futures registered small gains during the week, although the prices were mostly nominal. London stocks for the week showed a decrease of 692 tons. On July 30 announcement was made in London that the percentage of exports permitted for the quarter beginning August 1, 1927, would be 60 per cent. This was merely a formal notice in keeping with the provisions of the restriction plan.

The week ended August 6 showed a very marked undertone of strength, and prices closed with advances on all positions. August rubber on August 1 was at 34.9 cents bid and on August 6, 35.2 cents bid and 35.4 cents asked. Other positions were up in proportion. London stocks increased 807 tons during the week. The outlook was that the present level of prices will be maintained with an upward tendency liable to follow.

The week ended August 13 left the market very firm with the price at a higher level than at any time within a month. The advance is credited more to a scarcity of sellers than interest on the part of buyers. The range of high and low prices for the week showed spreads varying from ½ cent on the August position to 1½ cents on May, 1928, with all of the positions showing a strong advance.

During the week from August 15 to 20 the market was dull and the week closed with very little change in the price levels of the previous week. The range of high and low for all positions was slightly greater than one week previous. The gain of London stock during the weekly period was 380 tons.

In regard to restriction, on August 16 a news dispatch from abroad carried the statement that the Malayan government has considered the advisability of imposing a more stringent basis of assessment to bring it in accordance with the actual producing capacity of the estates. Rumors have been current in London for some time of revisions of assessments to be introduced November 1. According to private cables, a reduction of 50,000 to 60,000 tons in Malayan standard production will be made and the maximum per acre will be put in force.

It seems quite possible that some effort may be made to readjust the practical working of the restriction plan in order to shape the statistical position of rubber in closer conformity to current and prospective consumption.

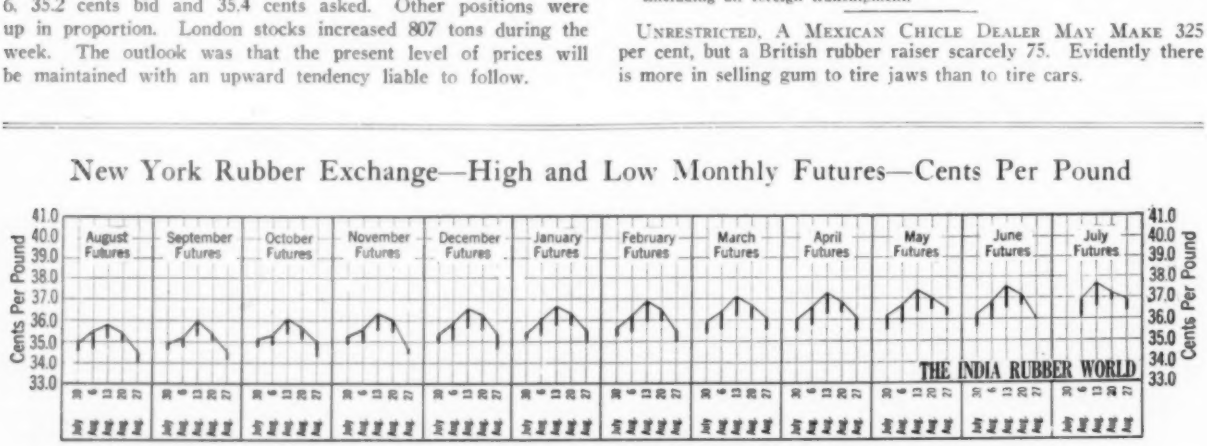
Plantation Rubber Exports from Malaya*

	January 1 to June 30, 1927		
	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	4,567.19	6,168.21	4,651.93
British Possessions	2,075.10	52.10	40.23
Continent of Europe	6,124.09	1,132.40	1,551.79
United States	84,405.23	15,498.32	6,453.79
Japan	5,374.39	1,439.50	1,312.40
Other Countries	39.85	.....	.....
Totals	102,585.85	24,290.53	14,010.14

*Excluding all foreign transhipment.

UNRESTRICTED. A MEXICAN CHICLE DEALER MAY MAKE 325 per cent, but a British rubber raiser scarcely 75. Evidently there is more in selling gum to tire jaws than to tire cars.

New York Rubber Exchange—High and Low Monthly Futures—Cents Per Pound



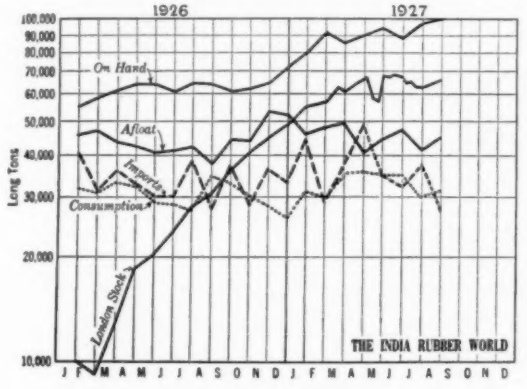
The Rubber Exchange of New York, Inc.

Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

1927	July 25	26	27	28	29	30	August 1	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19	20	22	23	24
July	34.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Aug.	34.8	34.9	34.6	34.8	34.9	34.9	34.9	34.7	34.7	35.1	35.5	35.2	35.2	35.5	35.5	35.6	35.8	35.8	35.2	35.2	35.4	35.3	35.0	35.0	34.8	34.7	34.7
Sept.	34.8	34.8	34.7	34.8	34.9	34.9	35.0	34.8	34.9	35.2	35.5	35.2	35.3	35.6	35.7	35.6	35.9	36.0	35.3	35.3	35.4	35.4	35.2	35.1	34.9	34.7	34.7
Oct.	34.9	35.0	34.8	35.0	35.1	35.1	35.1	34.9	35.0	35.3	35.5	35.3	35.4	35.8	35.9	35.8	36.0	36.1	35.3	35.3	35.7	35.4	35.3	35.2	35.1	35.0	35.0
Nov.	34.9	35.2	34.9	35.1	35.2	35.2	35.2	35.0	35.1	35.5	35.6	35.5	35.6	35.9	36.1	35.9	36.2	36.4	35.7	35.5	36.0	35.7	35.4	35.5	35.2	35.2	35.2
Dec.	35.1	35.2	35.0	35.2	35.3	35.3	35.3	35.1	35.3	35.6	35.9	35.7	35.7	36.1	36.4	36.0	36.5	36.6	35.8	35.8	36.3	35.9	35.6	35.6	35.4	35.5	35.4
1928																											
Jan.	35.2	35.3	35.2	35.3	35.4	35.4	35.4	35.3	35.4	35.7	36.0	35.8	35.8	36.2	36.4	36.1	36.5	36.7	35.8	35.8	36.3	36.0	35.8	35.9	35.6	35.7	35.6
Feb.	35.3	35.4	35.3	35.5	35.6	35.6	35.6	35.5	35.6	35.9	36.2	36.0	36.0	36.4	36.6	36.2	36.7	36.9	36.0	36.0	36.5	36.3	36.0	36.1	35.9	36.0	36.0
Mar.	35.4	35.6	35.4	35.7	35.9	35.8	35.7	35.6	35.7	36.0	36.4	36.3	36.2	36.6	36.8	36.4	36.8	37.1	36.1	36.1	36.7	36.6	36.2	36.3	36.1	36.2	36.2
April	35.5	35.7	35.7	35.9	36.0	35.9	35.9	35.8	35.8	36.1	36.6	36.4	36.3	36.7	36.9	36.4	36.9	37.3	36.4	36.3	36.7	36.8	36.5	36.5	36.3	36.4	36.4
May	35.6	35.9	35.9	36.0	36.2	36.0	36.0	36.0	35.9	36.2	36.7	36.6	36.4	36.9	37.0	36.5	37.1	37.4	36.6	36.5	36.8	37.0	36.8	36.8	36.6	36.7	36.6
June	35.7	36.0	36.1	36.2	36.3	36.2	36.2	36.0	36.0	36.3	36.8	36.7	36.5	37.0	37.1	36.6	37.2	37.6	36.7	36.7	37.0	37.1	36.8	36.8	36.7	36.8	36.8
July	...	...	...	...	...	...	36.3	36.1	36.1	36.4	36.9	36.8	36.6	37.1	37.2	36.7	37.4	37.7	36.9	36.9	37.2	37.2	36.9	36.9	36.8	37.0	37.0

Imports, Consumption and Stocks

The accompanying graph covers the crude rubber supply, consumption and stocks for 1926 and the first eight months of 1927. Stocks on hand in the United States advanced to 98,469 July 30. It is estimated that on August 31 they will total 100,000 tons. The imports in August are estimated at 28,000 tons



U. S. Imports, Consumption, Stocks, 1926-1927

compared with 38,667 in July, a reduction of 10,667 tons. Consumption in August is estimated at 31,000 tons or about 2,000 tons more than in July. London stocks advanced 807 tons from July 30 to August 20.

UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

1925	Imports Tons	Consumption Tons	Stocks On Hand† Tons	Stocks Afloat† Tons	London Tons	Singapore and Penang Tons†
Twelve months.....	384,837	389,136	51,000*	48,000*	.....	.....
1926						
Twelve months.....	411,900	358,415	72,510*	52,019*	.....	.....
1927						
January	45,736	31,500	76,171	45,218	54,786	26,443
February	29,446	29,000	76,000	48,000	56,962	26,766
March	39,500	36,100	91,086	49,597	63,167	27,844
April	48,700	35,900	92,800	39,000	67,034	24,543
May	36,569	34,590	94,600	44,200	56,668	25,133
June	33,194	33,800	89,250	47,233	64,486	21,898
July	38,667	29,219	98,469	40,587	63,626	18,674
August 25 (estimated)	28,000	31,000	100,000	45,000	65,000	.....

*December 31, 1925 and 1926.
†The first of each month.

Ceylon Rubber Exports from Jan. 1 to May 31, 1927

	Tons
To United Kingdom	6,217.62
Continent	946.46
Australia	551.60
America	16,031.16
Egypt	3.00
Africa	39.36
India	13.65
Japan	77.10
Total	23,879.95
For the same period last year	21,907.49

CEYLON ANNUAL EXPORTS, 1921-1926

	Tons
For the year 1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

CZECHOSLOVAKIA'S IMPORTS DURING 1926 FROM THE UNITED States of rubber, gutta percha, and the products of these materials showed a gain over 1925 of 8,300,000 crowns, the total figure for 1926 being 14,700,000 crowns. A Czechoslovakian crown is considered equal to $0.03.

Reclaimed Rubber Market

The demand for reclaimed rubber continued fairly brisk during August, and the general consuming requirements are unchanged. In many instances rubber companies are ordering in advance of contract schedules and in no case are orders being cancelled. In all divisions of the industry reclaims, like other supplies, are being purchased on the basis not much in excess of current needs in order to forestall possible loss by overstocking.

The economy of reclaims is being taken advantage of in the production of low priced unguaranteed tires and in those guaranteed for very moderate mileages. The working and aging qualities of reclaims make it practical for use in every rubber goods line, including inner tubes and many druggists' sundries items.

It is notable that the pioneering in the advanced use of reclaim is done by the smaller tire companies with the larger ones trailing when the trail is blazed.

The quotations noted below are mostly unchanged from those of a month ago. Black selected auto tire grade has declined ¼ cent a pound; dark gray auto tire grade dropped ¾ cent a pound. Super reclaim No. 1 black has advanced ½ cent and No. 2 tube reclaim is up 1 cent a pound. In the latter case this advance reflects the sharp rise in No. 2 inner tube scrap.

New York Quotations

August 25, 1927

	Specific Gravity	Price Per Pound
Auto Tire		
Black	1.21	$0.08 @ $0.08½
Black, washed	1.18	.10 @ .10¼
Black selected tires	1.20	.08¾ @ .09
Dark gray	1.35	.11¼ @ .12
Light gray	1.38	.13 @ .13¼
White	1.40	.15 @ .15½
High Tensile		
Super-reclaim, No. 1 Black	1.20	.17½ @ .18
No. 2 Black	1.20	.14 .14½
High tensile red	1.20	.14 @ .14½
Shoe		
Unwashed	1.60	.08 @ .08¼
Washed	1.50	.10¼ @ .10¾
Tube		
No. 1	1.00	.17 @ .17½
No. 2	1.18	.13½ @ .14½
Miscellaneous		
Red	1.35	.14 @ .14½
Truck tire, heavy gravity	1.55	.07½ @ 07¾
Truck tire, light gravity	1.40	.08 @ .08¼
Mechanical blends	1.60	.07 @ .08

British Malaya

RUBBER EXPORTS

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that the amount of rubber exported from British Malaya during the month of July last totaled 23,947 tons. The amount of rubber imported was 12,697 tons of which 10,187 tons were declared as wet rubber. The following are comparative statistics:

	1926		1927	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	30,452	10,237	34,946	14,995
February	30,440	8,306	27,528	11,697
March	35,012	14,800	41,346	17,462
April	23,727	10,566	29,041	13,069
May	31,231	10,604	31,393	15,491
June	30,624	11,764	32,607	14,706
July	28,824	15,280	23,947	12,697
Totals	210,310	81,556	220,808	100,117

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of June and July, 1927:

	June, 1927 Tons	July, 1927 Tons
United Kingdom	6,551	5,239
United States of America	22,112	14,660
Continent of Europe	2,222	1,934
British Possessions	593	419
Japan	1,120	1,671
Other foreign countries	9	24
Totals	32,607	23,947

The Market for Rubber Scrap

Business in rubber scrap during August has shown increased activity, especially in inner tubes and tires. In all grades, however, the general rule is hand-to-mouth buying. Tire and other scrap collections have somewhat increased. The quotations on nearly three-quarters of the grades listed below remain unchanged from those of one month ago. On the remainder a sharp advance has been made except in the case of No. 1 hard rubber which shows a decline of ½ cent a pound.

AIR BRAKE HOSE. The demand has improved slightly with prices advanced $5 per ton.

BOOTS AND SHOES. Consumer demand has increased a little but as a whole this grade is moving slowly. It is one of the most easily collected rubber stocks, therefore is very stable in price because every strong demand brings forth more than enough scrap to cover the situation.

INNER TUBES. These have advanced very strongly on all grades due to the fact that reclaimers held off all summer hoping for a decline. Their stocks became low and the concerted buying that became necessary put up the price. Tube scrap collections are active but have not overtaken the demand.

MECHANICAL GRADES. These generally are in very light demand. Quotations on all grades except air brake hose are unchanged from the July prices.

TIRES. On pneumatic grades, except mixed peelings, prices are unchanged from a month ago. Although in the interval there was a slump from July quotations which in a subsequent reaction was fully recovered. Mixed auto peelings are $32 to $33, up to $2 a ton above last month's figures.

Quotations for Carload Lots

August 25, 1927

Boots and Shoes			
Boots and shoes, black	lb.	$0.01¼@	$0.01⅞
Red and white	lb.	.00¾@	.01
Trimmed arctics, black	lb.	.00¾@	.00⅞
Untrimmed arctics	lb.	.00¾@	.00⅞
Tennis shoes and soles	lb.	.01 @	
Hard Rubber			
No. 1 hard rubber	lb.	.09½@	.10
Battery jars, black compound	lb.	.01⅞@	.02
Inner Tubes			
No. 1, floating	lb.	.07½@	.07¾
No. 2, compounded	lb.	.05¼@	.05½
Red	lb.	.06 @	.06¼
Mixed tubes	lb.	.05¼@	.05½
Mechanicals			
Mixed black scrap	lb.	.00¾@	.00⅞
Heels	lb.	.00½@	.00⅝
Hose, air brake	ton	30.00 @	31.00
regular soft	ton	15.00 @	17.00
No. 1 red	lb.	.01¼@	.01⅞
No. 2 red	lb.	.01 @	
White, druggists' sundries	lb.	.03½@	
Mechanical	lb.	.01½@	.01⅝
Tires			
Pneumatic Standard—			
Mixed auto tires with beads	ton	22.00 @	23.00
Beadless	ton	31.50 @	32 50
White auto tires with beads	ton	40.00 @	42.00
Beadless	ton	50.00 @	52.00
Mixed auto peelings	ton	32.00 @	33.00
Solid—			
Mixed motor truck, clean	ton	25.00 @	26.00

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During the Month of June, 1927

	Landed for June	Delivered for June	Stocks, June 30		
			1927	1926	1925
LONDON	Tons	Tons	Tons	Tons	Tons
Plantation	8,548	11,829	63,709	23,776	*5,143
Other grades	7	4	128	153	*58
LIVERPOOL					
Plantation	†515	†460	†2,985	†1,028	†306
Total tons, London and Liverpool	9,070	12,293	66,822	24,957	5,507

† Official returns from the six recognized public warehouses.
* Corrected by inspection.

United States Rubber Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	May, 1927		Five Months Ended May, 1927	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	81,799,549	$30,984,377	425,402,960	$156,862,874
Balata	146,426	56,591	510,086	187,202
Jelutong or Pontianak	1,709,165	227,949	7,514,697	1,185,933
Gutta percha	347,459	78,755	1,458,943	308,721
Guayule	949,661	222,419	4,678,536	1,131,628
Rubber scrap	2,050,592	83,291	10,301,478	447,878
Totals	87,002,852	$31,653,382	449,866,700	$160,124,236
Chicle *dutiable*	1,026,044	$540,354	7,080,440	$3,569,009
MANUFACTURED—*dutiable*				
Rubber belting	39,197	$23,042	273,931	$168,886
Rubber tires	247	4,685	1,645	32,137
Other manufactures of rubber	.....	82,825	.....	564,331
Totals	39,444	$110,552	275,576	$765,354

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	6,231,559	$2,501,562	24,857,874	$10,901,683
Balata	4,758	1,825	39,647	15,897
Gutta percha and rubber substitutes and scrap	2,300	266	42,601	3,512
Rubber manufactures	.....	5,053	.....	153,236
Totals	6,238,617	$2,508,706	24,940,122	$11,074,328

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
India rubber				
Reclaimed	2,091,968	$192,266	8,993,113	$909,239
Scrap and old	2,667,491	166,797	11,350,991	722,463
Footwear				
Boots *pairs*	29,508	84,600	191,150	523,678
Shoes *pairs*	63,840	46,154	393,691	325,901
Canvas shoes with rubber soles *pairs*	412,951	279,631	2,235,168	1,516,241
Rubber water bottles and fountain syringes *number*	14,339	9,250	110,447	69,186
Rubber gloves *doz. pairs*	6,231	20,018	28,762	96,026
Other "druggists' rubber sundries	.....	27,352	.....	173,720
Bathing caps *doz.*	22,769	43,898	103,478	205,552
Hard rubber goods				
Electrical hard rubber goods	35,023	13,932	482,337	121,261
Other hard rubber goods	.....	23,409	.....	125,337
Tires				
Casings, automobile *number*	215,442	2,838,312	1,145,214	14,489,141
Tubes, automobile *number*	126,717	284,701	635,432	1,326,222
Other casings and tubes, *number*	4,726	13,500	20,061	61,672
Solid tires for automobiles and motor trucks *number*	6,150	193,527	47,575	1,453,784
Others	118,608	29,252	498,480	138,359
Tire accessories	.....	166,895	.....	713,127
Rubber and friction tape	145,347	45,948	714,215	198,244
Belting	426,316	213,942	2,063,751	1,092,986
Hose	615,481	235,302	2,922,246	1,136,813
Packing	180,215	86,329	997,026	464,632
Soles and heels	340,385	99,110	1,866,259	595,937
Thread	142,503	180,135	656,372	838,460
Rubber bands and erasers	84,053	60,314	364,448	268,043
Other rubber manufactures	.....	188,225	.....	1,018,272
Totals	.....	$5,307,497	.....	$28,584,296
Rubber toys and balls	.....	$12,892	.....	$72,263
Rubber balloons *gross*	39,111	$47,148	226,788	$288,371

Imports of Crude Rubber Into the United States by Customs Districts

	*June, 1927		Six Months Ended *June, 1927	
	Pounds	Value	Pounds	Value
Massachusetts	4,610,860	$1,647,814	26,153,738	$9,682,252
St. Lawrence	.....	.....	6,864	2,265
Buffalo	.....	.....	23,948	9,024
New York	59,436,279	22,460,121	438,641,491	162,281,932
Philadelphia	1,079,559	366,682	1,695,549	573,281
Maryland	4,961,011	1,925,234	11,646,158	4,320,876
New Orleans	.....	.....	2,057	227
Los Angeles	3,209,033	1,184,389	13,788,791	5,057,394
San Francisco	94,527	33,018	3,171,394	1,230,855
Oregon	22,400	8,366	582,619	226,954
Washington	56,000	21,840	112,000	44,240
Dakota	.....	.....	28	10
Michigan	.....	.....	910	325
Chicago	500	128	500	128
Ohio	438,459	159,128	2,824,741	991,975
Colorado	112,000	43,294	772,800	291,150
Totals	74,020,628	$27,850,014	499,423,588	$184,712,888

*Including latex, dry rubber content.

Compounding Ingredients Market

MANUFACTURING activity in the Akron district experienced a slight diminution previous to the middle of the month. This was followed by a strong recovery to full schedules at which rate tires are now being produced. The mechanical goods division is fairly active. The footwear plants have resumed after a brief vacation period for repairs.

ACCELERATORS. The pronounced swing towards adoption of short cures at relatively low temperatures has this month as last, brought out a new accelerator, Thermlo-F. Such non-toxic accelerators of wide applicability are gaining in favor.

ANTI-OXIDANTS. The standard brands of anti-oxidants are in steady demand and have fully demonstrated their practical value in rubber goods of all grades. A new anti-oxidant of British manufacture known as Non-Ox is the latest addition to rubber age resisters.

BENZOL. This solvent is in good demand with ample supplies available. The market has gained in stability and there is no change in price.

CARBON BLACK. Spot demand rules quiet. There is plenty of inquiry but rubber trade consumers have slackened their requirements.

LITHARGE. Consumption is in steady routine. Early in August corroders increased the price one quarter cent owing to the advance in pig lead.

LITHOPONE. Early in the month withdrawals on contract increased. Requirements of consumers generally are covered for the balance of the year. Spot lithopone is active.

MINERAL RUBBER. The output of mineral rubber is proceeding at full capacity to keep pace with the demand of the rubber trade for this material which finds an important use in a great variety of goods of high and low grade.

SOLVENT NAPHTHA. Stocks are plentiful. Consumer demand is steadily increasing and the market is easy.

STEARIC ACID. This relatively new ingredient for rubber compounding is meeting with general favor in the trade because of its influence in stabilizing the curing quality of rubber.

ZINC OXIDE. Prices of domestic oxide are firm with consuming demand routine. Large users in the rubber trade are covered on their needs for the remainder of the year.

New York Quotations

August 25, 1927

Accelerators, Inorganic

Lead, carbonate	*lb.*	$0.09	@
Lead, red	*lb.*	.10¼	@
sublimed white	*lb.*	.08½	@
sublimed blue	*lb.*	.08½	@
super-sublimed white lead	*lb.*	.08¾	@
Lime, R. M. hydrated	*ton*	12.80	@
Litharge	*lb.*	.09¼	@
Magnesia cal., light	*lb.*	.15	@
calcined, extra light	*lb.*	.25	@
calcined, heavy	*lb.*	.04	@
magnesium, carb., light		.06	@ .06½
Orange mineral A.A.A	*lb.*	.12¼	@

Accelerators, Organic

A-7	*lb.*	.70	@ .80
A-11	*lb.*	.75	@ .90
A-16	*lb.*	.70	@ .85
A-19	*lb.*	.75	@ .90
Aldehyde ammonia	*lb.*	.65	@ **.70**
B. B.	*lb.*		@
Captax	*lb.*		@
Crylene, hard form	*lb.*		@
Paste	*lb.*		@
Di-ortho-tolylguanidine	*lb.*	.85	@ .90
Diphenyl guanidine	*lb.*	.68	@ .72
Ethylidine aniline	*lb.*	.60	@ .65
Formaldehyde aniline	*lb.*	.38	@ .42
P. A. C.	*lb.*	.09½	@ .10
Grasselerator 102	*lb.*	.65	@ **.70**
552	*lb.*	4.45	@ 4.60
808	*lb.*	1.05	@ **1.35**
833	*lb.*	1.55	@ 1.75
Heptene	*lb.*		@
Hexamethylene tetramine	*lb.*	.65	@ .70
Lithex	*lb.*		@
Methylene dianiline	*lb.*	.40	@
Monex	*lb.*		@
No. 999 lead oleate	*lb.*	.16	@
Phenyl orthotolyl guanidine	*lb.*	.76½	@ .81
Piperidine piperidyl dithio carbamate	*lb.*	4.45	@ 4.60
R. & H. 40	*lb.*	.50	@ .55
50	*lb.*	.50	@ .55
Safex	*lb.*		@
Super-sulphur, No. 1	*lb.*		@
No. 2	*lb.*		@
Tensilac No. 39	*lb.*	.55	@ .60
No. 41	*lb.*	.65	@ .70
Thionex	*lb.*	3.25	@
Thiocarbanilid	*lb.*	.26	@ .28½
Trimene	*lb.*		@
base	*lb.*		@
Triphenylguanidine	*lb.*	.65	@ **.70**
Tuads	*lb.*		@
Vulcanex	*lb.*	.86	@
Vulcanol	*lb.*	1.08	@
Vulcone	*lb.*	.74	@
Z-88	*lb.*	.80	@ 1.00
Zimate	*lb.*		@

Acids

Acetic 28% (bbls.)	*100 lbs.*	3.37½	@
glacial (carboys)	*100 lbs.*	12.41	@12.66
Oleic	*lb.*	.09½	@ .10
Stearic	*lb.*	.13½	@ .14
Sulphuric, 66°	*100 lbs*	1.60	@

Alkalies

Caustic soda, solid	*lb.*	$0.037	@

Anti-Oxidants

Age-Rite	*lb.*		@
Antox	*lb.*	.83	@
Neozone	*lb.*	.74	@
V. G. B.	*lb.*		@

Colors

BLACK

Bone	*lb.*	.07	@ .21
Carbon (see Comp. Ing.)			
A. & W. nonfli No. 1	*lb.*	.40	@
No. 2	*lb.*	.25	@
Drop	*lb.*	.06	@ .10
Lampblack (commercial)	*lb.*	.09	@

BLUE

A. & W. blue	*lb.*	1.25	@ 5.00
Du Pont, N	*100 lbs.*	1.35	@
Marine, A. C	*100 lbs.*	1.30	@
5 R	*100 lbs.*	1.00	@
2 G	*100 lbs.*	.90	@
Prussian	*lb.*	.33	@ .35
Ultramarine	*lb.*	.08	@ .35

BROWN

Sienna, Italian, raw	*lb*	.05	@ .12½

GREEN

A. & W. green	*lb.*	1.25	@ 3.00
Chrome, light	*lb.*	.27	@ .31
medium	*lb.*	.28	@ .31
dark	*lb.*	.30	@ .33
Du Pont, A. C	*100 lbs.*	3.00	@
4 G	*100 lbs.*	.60	@
G. L.	*100 lbs.*	.30	@
Y. L.	*100 lbs.*	.75	@
Oxide of chromium	*lb.*	.31	@ .38

ORANGE

Du Pont, 2 R	*100 lbs.*	1.40	@
R. X.	*100 lbs.*	1.30	@
Y. O.	*100 lbs.*	1.60	@

RED

A. & W. red	*lb.*	.75	@ 3.50
purple	*lb.*	2.00	@ 4.00
Antimony, golden, No. 40	*lb.*	.22	@ .25
No. 60	*lb.*	.16	@ .20
golden 15/17%	*lb.*	.16	@ .20
T. K. "Special" 1%	*lb.*	.38	@
Pentasulphide 15/17%	*lb.*	.18	@

Colors—*(Continued)*

Antimony,			
Crimson, R.M.P. No. 3	*lb.*	$0.48	@
Sulphur free	*lb.*	.52	@
T. K. 15/17%	*lb.*	.40	@
7-A	*lb.*	.35	@
Z-2	*lb.*	.21	@
Vermilion, No. 5	*lb.*	.50	@ .55
No. 15	*lb.*	.37½	@ .42
Du Pont R. I.	*100 lbs.*	2.00	@
6 B	*100 lbs.*	1.10	@
Brilliant A. C.	*100 lbs.*	1.05	@

Iron Oxides

bright pure domestic	*lb.*	.12	@
bright pure English	*lb.*	.14	@
bright reduced English	*lb.*	.10½	@
bright reduced domestic	*lb.*	.10	@
Indian (maroon), pure domestic	*lb.*	.11	@
Indian (maroon), pure English	*lb.*	.10½	@ .11
Indian (maroon), reduced English	*lb.*	.09½	@ .10
Indian (maroon), reduced domestic	*lb.*	.08	@
Oximony	*lb.*	.13¼	@
Spanish red oxide	*lb.*	.02½	@ .04½
Venetian reds	*lb.*	.02	@ .06
Vermilion, English quicksilver	*lb.*	1.85	@

WHITE

Lithopone	*lb.*	.05½	@
Azolith	*lb.*	.05¼	@ .05¾
Grasselli	*lb.*	.05¼	@ .05½
Sterling	*lb.*	.05⅜	@ .06⅛
Zinc Oxide			
AAA (lead free)	*lb.*	.07	@
Azo (factory):			
ZZZ (lead free)	*lb.*	.06½	@ .07
ZZ (leaded)	*lb.*	.06½	@ .07⅛
Z (8% leaded)	*lb.*	.06¼	@ .07⅛
French Process			
Green seal	*lb.*	.10⅞	@
Red seal	*lb.*	.09⅞	@
White seal	*lb.*	.11⅞	@

YELLOW

A. & W. yellow	*lb.*	2.00	@ 4.00
T. K. sulphide	*lb.*	.65	@
Cadmium sulphide	*lb.*	.95	@ 1.25
Chrome	*lb.*	.16	@ .18
Du Pont N	*100 lbs.*	4.00	@
R. R	*100 lbs.*	1.55	@
Grasselli cadmium	*lb.*	1.50	@
Ochre, domestic	*lb.*	.01¾	@ .02¼
imported	*lb.*	.03	@ .03¼
Oxide, pure	*lb.*	.10½	@
Zinc imported	*lb.*	.24	@

New York Quotations

August 25, 1927

Compounding Ingredients

Aluminum flake (sacks c.l.)	ton	$21.85	@
(sacks l.c.l.)	ton	24.50	@
Ammonium carbonate powd.	lb.	.11	@ .17½
lump	lb.	.11	@ .16½
Asbestine	ton	13.40	@14.50
Barium, carbonate	ton	50.00	@55.00
dust	lb.	.05	@ .06
sulphate, dry	lb.	.11	@ .15
Barytes, imported	ton	27.00	@34.00
water ground and floated	ton	34.00	@35.00
dry ground, white	ton	40.00	@
dry ground, off color	ton	25.00	@
No. 1 Missouri, water ground and floated, St. Louis	ton	21.60	@23.00
Basofor	lb.	.04½	@
Blanc fixe, dry	ton	85.00	@90.00
pulp	ton	60.00	@63.00
Carbon Black			
Aerfloted arrow	lb.	.09	@ .13
Compressed	lb.	.07½	@ .11½
Uncompressed	lb.	.07	@ .11
Micronex	lb.	.08	@ .12
Carrara filler	ton	26.00	@
Chalk, precipitated	lb.	.04¼	@ .04¾
Clay, Blue Ridge, dark	ton		@
China	lb.	.01½	@
Dixie	ton		@
Mineral flour (Florida)	ton	20.00	@23.00
Perfection	ton	14.00	@
Suprex	ton	13.00	@26.00
Cotton flock, black	lb.	.10	@ .12
light-colored	lb.	.12	@ .14
white	lb.	.12½	@ .27
Fossil flour	lb.	.02½	@
Glue, high grade	lb.	.22	@ .26
low grade	lb.	.18	@ .22
Infusorial earth	lb.	.02½	@
Mica, amber (fact'y)	ton	80.00	@
Pumice stone, powd.	lb.	.02½	@ .04
Rotten stone (bbls.)	lb.	.02½	@ .04½
Soap bark	lb.	.15	@ .16
Soapstone	ton	15.00	@22.00
Talc, domestic	ton	18.00	@25.00
French	ton	18.00	@22.00

Compounding Ingredients—*(Continued)*

Thermatomic carbon	lb.		@
Titanox	lb.	$0.10	@$0.10½
Velvetex	lb.	.04	@ .07
Whiting:			
Commercial	100 lbs.	.85	@ 1.00
English, cliffstone	100 lbs.	1.50	@
Quaker	ton		@
Snow white	ton	12.00	@23.00
Sussex	ton		@
Westminster Brand	100 lbs.		@
Witco (c.l.) (fact'y)	ton	12.00	@
Whiting, imp. chalk	100 lbs.	1.00	@ 1.25
Paris White, Eng. Cliff	100 lbs.	2.00	@ 3.50

Factice—See Rubber Substitutes

Mineral Rubber

Genasco (facty.)	ton	50.00	@52.00
Gilsonite (fact'y)	ton	37.14	@39.05
Granulated M. R.	ton		@
Hydrocarbon, hard	ton		@
Hydrocarbon, soft	ton	28.00	@34.00
Ohmlac Kapack, M. R.	ton	40.00	@90.00
M-4	ton		@
Paradura (fact'y)	ton	62.50	@65.00
Pioneer, M. R., solid (fac.)	ton	42.00	@45.00
M. R. granulated	ton	52.00	@55.00
Robertson, M. R., solid (facty.)	ton	34.00	@38.00
M. R. gran. (facty.)	ton	34.00	@80.00

Oils (Softeners)

Castor, No. 1, U. S. P.	lb.	.13	@
No. 3, U. S. P.	lb.	.12½	@
Corn, crude (bbls.)	lb.	.11½	@ .12
Cotton	lb.	.09	@ .10½
Cycline	gal.	.28	@ .34
Degras	lb.	.04¾	@ .06
Fluxrite, fluid	lb.	.05	@ .06
solid	lb.	.05	@ .06
Glycerin	lb.	.24	@ .24½
Linseed, raw	lb.	.12	@ .125
Palm lagos (casks)	lb.	.07¾	@ .11
niger (casks)	lb.	.02¼	@ .10½
Petrolatum, standard	lb	.05¾	@
Pigmentar	gal.	.33	@ .39
Pine, steam distilled	gal.	.68	@ .70
Plastone	lb	.39	@
Rapeseed, refined	gal.	.80	@ .81
Rosin	gal.	.58	@ .65
Stearex	lb.	.11	@ .15
Tackol	lb.	.10	@ .12

Resins and Pitches

Pitch	bbl.	$7.50	@$8.50
Rosin, K (bbl.)	280 lbs.	11.00	@
Rapeseed, refined	gal.	.75	@ .76
Tar, retort	bbl.	13.00	@14.00

Rubber Substitutes or Factice

Black	lb.	.08	@ .14
Brown	lb.	.08	@ .15
White	lb.	.09	@ .16

Solvents

Benzol (90%, 7.21 lbs. gal.)	gal.	.28	@
Carbon bisulphide (99.9%, 10.81 lbs. gal.) (drums)	lb.	.05	@ .06
tetrachloride (99.7%, 13.28 lbs. gal.) (drums)	lb.	.07½	@ .08
Gasoline			
No. 303			
Tankcars	gal.	.16	@
Drums, c. l.	gal.	.25	@
Drums, l. c. l.	gal.	.27	@
Naphtha	gal.	.09¾	@ .13½
Turpentine, spirits	gal.	.58½	@ .59½
steam distilled	gal.	.55	@ .57

Vulcanizing Ingredients

Sulphur			
Velvet flour	100 lbs.	2.60	@ 3.50
Soft rubber (c.l.)	100 lbs.	2.60	@ 2.95
(l.c.l.)	100 lbs.	2.95	@ 3.30
Superfine commercial flour (c.l.)	lb.	2.20	@ 2.55
(l.c.l.)	lb.	2.60	@ 3.10
Tire brand, superfine	100 lbs.	2.20	@ 2.55
Tube brand, velvet	100 lbs.	2.60	@ 2.95
(See also Colors—Antimony)			

Waxes

Beeswax, white, com.	lb.	.55	@
carnauba	lb.	.38	@ .50
ceresine white	lb.	.12	@
montan	lb.	.07	@ .07½
orokerite, black	lb.	.27	@
green	lb.	.28	@
Paraffin			
122/124 white crude scale	lb.	.03	@
124/126 white crude scale	lb.	.03	@
120/122 fully refined	lb.	.05½	@
125/127 fully refined	lb.	.05¾	@

GRASSELERATOR 833

Grasselerator 833 is a liquid aldehyde amine condensation product, prepared as a low-temperature accelerator to meet the present day rubber practice of vulcanizing at low temperatures. This accelerator is efficient at 248 degrees F. or 14 pounds of steam. Its rate of cure increases constantly with increase of temperature, giving high modulus and unusually high tensiles over a wide curing range. In the presence of carbon black it retains its activity and is equally well suited to cures in air or steam. It has distinct anti-oxidant value. The manufacturers claim that reclaimed rubber maintains its highest tensile properties when cured with this accelerator.

Safex

Safex is a new ultra-accelerator for use at 10 pounds of steam or above. The chief obstacle to the quick general adoption hitherto of this type of accelerator has been the necessity of using considerable care in handling stocks on the mill, calender and in storage. Safex, however, has great accelerating activity at temperatures as low as 10 pounds of steam and yet is unusually free from trouble in handling at ordinary mill temperatures.

Safex is a definite chemical, a finely powdered crystalline yellow solid of specific gravity 1.54 and melting point about 140 degrees C. It is stable and shows no sign of decomposition after a period of more than two years in storage under ordinary conditions, nor is it poisonous to workers. It is soluble in benzol but not appreciably so in water. On the mill it disperses freely into rubber and is adaptable to mold, open steam or air curing. It works well in stocks containing high proportions of reclaim and with the commonly used fillers and softeners. Zinc oxide is necessary to bring out the full effect of this accelerator.

In making up good aging compounds to be cured quickly at low temperatures, the curing and accelerating ingredients must be carefully balanced so that they are exhausted when the cure is completed. Safex is no exception to this rule for ultra-accelerators. For this reason the generous use is suggested of a good anti-oxidant particularly as a safeguard against rapid aging of unbalanced compounds. This rule is good practice even in all perfectly balanced compounds regardless of the individual accelerator used.

The following typical formulas illustrate the adaptability of Safex for tire treads and tire friction and coating either of which will cure at 10, 20 or 30 pounds of steam in times ranging from 20 to 45 minutes with tensiles ranging from 2,300 to over 3,600 pounds per square inch.

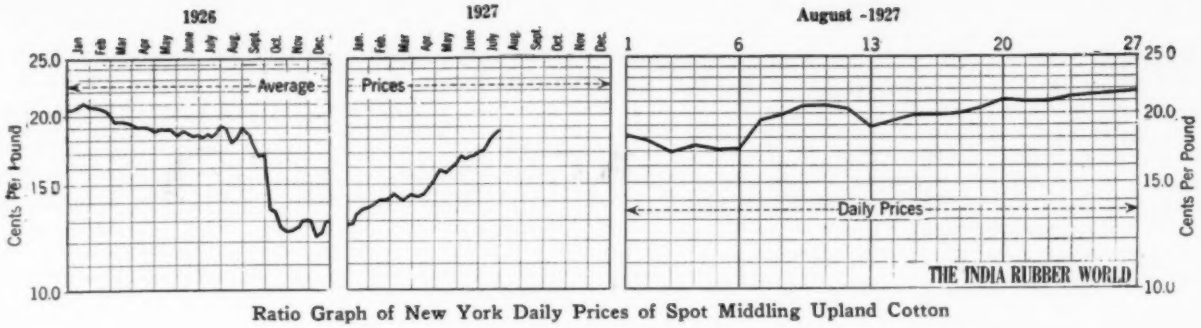
TIRE STOCK FORMULAS

	Tread	Friction and Coating
Rubber	100	100
Whole tire reclaim	20	110
Carbon black	55	none
Soft black	none	30
Zinc oxide	5	12
Stearic acid	3	1
Pine tar	3	none
Palm oil	2	none
Mineral rubber	3	15
Mineral oil	none	8
V G B	3	3
Safex	1.3125	1.125
Sulphur	3.3125	5.25

Example of an All Reclaim Molding Stock Containing Safex

Whole tire reclaim	25.00
Truck tire reclaim	30.00
Zinc oxide	2.00
Whiting	23.00
Mineral rubber	15.00
Lime	3.00
V G B	0.50
Safex	0.25
Sulphur	1.25
	100.00

This stock cures in from 5 to 15 minutes at temperatures ranging from 20 to 70 pounds of steam, 258 to 316 degrees F. with tensiles ranging from 500 to 600 pounds.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Market for Cotton and Fabrics

AMERICAN COTTON. The price for spot middling cotton on August 1 was 18.25 cents a pound, but it declined to 17.15 cents on August 6. The government report August 8 of the crop condition started a sharp reaction upward by showing an indicated yield of only 13,493,000 bales, when the trade as a whole was looking for a figure of about 15,000,000 bales. The report in its summary says that such a low yield is indicated because of the heavy weevil infestation which is four times greater than last year. Damage by flood also acted to reduce the yield.

The market effect of the report was to send spot cotton upward from 19.45 cents on August 8 to 21.00 cents. One of the leading New York cotton market letters observes as follows:

There lies behind the market, therefore, a tremendous potential trade demand, which alone, without any speculative demand that might develop, could very easily carry prices forward to a much higher level. Whether this will come before the next government report is something that no one can foretell. Whether it will not exert itself until after the movement has gotten well started is also a question, but it is a perfectly self-evident fact that if the world once starts to buy this year's cotton crop in any volume, this demand will easily absorb the offerings from the South, since the supply from the new crop is apparently becoming more and more restricted, and more and more inadequate when based on anything like last year's consumption.

EGYPTIAN COTTON. Early in August reports reached Boston indicating excellent progress of the cotton crop of Upper Egypt. Picking has already commenced there. In regard to the acreage and crop the following report is made by the agricultural expert of P. Augustino & Co.:

The acreage planted in cotton for the whole of Egypt is 1,600,000 feddans. The third period of the leaf worm has caused no damage. The worm still exists in the province of Behera, but peasants take every care to destroy these insects. The damage caused is about 6 per cent.

Bolls have opened on early planted lands in Lower Egypt and the first picking will take place at the end of August, about 10 days earlier than last year. The new crop can be estimated as follows:

	Cantars
Upper Egypt	2,500,000
Sakels	2,250,000
Pilions, Casulli, etc.	1,500,000
	6,250,000

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market for these goods is very strong and active on account of the sharp advance in the raw cotton market.

The sharp rise in the price of cotton fabrics due to the report of unfavorable crop prospects is liable to continue while the actual size of the crop for the current season is being determined because fabrics have not yet been advanced to a basis showing a profit on today's cotton cost.

New York Quotations

August 25, 1927

Drills

38-inch 2.00-yard	*yard*	$0.18½ @
40-inch 3.47-yard		.10⅞ @
50-inch 1.52-yard		.25 @
53-inch 1.90-yard		.20 @
55-inch 2.20-yard		.17⅜ @
59-inch 1.85-yard		.20⅜ @

Ducks

38-inch 2.00-yard S. F.	*yard*	.19 @
40-inch 1.45-yard S. F.		.25⅞ @
72-inch 1.05-yard D. F.		.36⅛ @
72-inch 16.66-ounce		.39½ @
72-inch 17.21-ounce		.40⅜ @
MECHANICAL		
Hose and belting	*pound*	.37 @
Specials		.41 @
TENNIS		
52-inch 1.35-yard	*yard*	.28½ @

Hollands

RUBBER TRADE SPECIAL R. T. 3 A.		
31-inch	*yard*	.20 @
40-inch		.25 @
50-inch		.45 @
RED SEAL		
36-inch		.15½ @
40-inch		.16 @
50-inch		.25 @
GOLD SEAL		
40-inch, No. 72		.20 @
40-inch, No. 80		.21½ @

Osnaburgs

40-inch 2.35-yard	*yard*	$0.15⅜ @
40-inch 2.48-yard		.15 @
40-inch 3.00-yard		.12⅜ @
37-inch 2.42-yard		.15⅜ @

Raincoat Fabrics

COTTON		
Bombazine 64 x 60	*yard*	.11½ @
Bombazine 60 x 48		.10½ @
Plaids 60 x 48		.12½ @
Plaids 64 x 60		.13½ @
Plaids 48 x 48		@
Surface prints 60 x 48		.12½ @
Surface prints 64 x 60		.13½ @
Print cloth 38½-inch, 64 x60		.07½ @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.13 @ .13¼
48 x 48, 2.85-yard		.12 @ .12⅜
64 x 68, 3.15 yard		.12½ @
56 x 60, 3.60-yard		.11 @ .11⅜
48 x 44, 3.75-yard		.09¾ @

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.07¾ @ .08
44 x 40, 6.15-yard		.06¼ @ .06⅜

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Egyptian, karded	*pound*	$0.51 @
Peeler, karded		.44 @
BUILDER 23/11		
Peeler, karded		.48 @
BUILDER 10/5		
Peeler, karded		.45 @
CORD 23/5/3		
Egyptian, combed	*pound*	.67 @
Egyptian, karded		.62 @
Peeler, karded, 1 7/16-in.		.45 @
CORD 23/4/3		
Peeler, karded	*pound*	.50 @
CORD 23/3/3		
Peeler, karded	*pound*	.47½ @
CORD 15/3/3		
Peeler, karded	*pound*	.47 @
CORD 13/3/3		
Peeler, karded	*pound*	.46 @
LENO BREAKER		
8-oz. Peeler, karded	*pound*	.42½ @
10-oz. Peeler, karded		.43 @
CHAFER		
9.5-oz. Peeler, karded	*pound*	.41 @
12-oz. Peeler, karded		.44 @
14-oz. Peeler, karded		.45½ @

RAINCOAT FABRICS. Prices on all goods have advanced from ½ to 1 cent a yard due to the recent rise in gray goods. Business on raincoat leatherette has been very good right along, but on the high colors it has just begun to pick up and in these lines a larger volume of business is expected this season than last.

SHEETING. The market is active and prices have risen from 10 to 15 per cent. Purchases are running into the first of next year at the present advances in prices. The increase is attributable largely to the bullish government report of August 8.

TIRE FABRICS. The outstanding features of the market are that the radical rise in the price of cotton has caused the price of fabrics to increase very materially and buyers are operating only for their nearby needs. They hesitate to make any forward contracts until the cotton crop is further along and a definite price trend is better established. There is apparently a fair amount of comparatively nearby business that has to be placed so that inquiries are coming into the market with fair frequency.

The Cotton Outlook

The chief features of the cotton outlook are the prospective damage by weevils and the shortage of the crop as indicated by the government report of August 8. Although the weevil has been present in all cotton states it has been active mainly in the eastern belt, southwestern portions of the central belt and locally in the west.

It was reported early in August that Georgia is the most heavily infested, and the yield, with the exception of extreme northern and a few northwestern counties, will be greatly reduced unless the balance of the month of August shows more propitious weather conditions. The next state highly infested is South Carolina, with Alabama third in line. Mississippi, Louisiana, Texas and Arkansas are infested, but weather conditions have not been such a tremendous aid to their propagation as in states of the eastern belt.

The crop is well fruited, except where stung by weevil, and in this case blooming and squaring are light. Hundreds of correspondents report weevil infestation worse than 1921 and 1923.

The reliability of the government cotton crop report indicating a yield of 13,492,000 bales is endorsed by Professor J. A. Todd of Liverpool, England, a recognized international authority on cotton. While not passing judgment on the final crop Professor Todd states that west Texas has no weevil and is making splendid progress, which will mean a good yield, if weather remains favorable and there is a late frost. An early frost would be nothing short of a catastrophe for the crop in view of the understanding that one-half the belt is believed to be late. Continued boll weevil damage on a large scale could easily reduce the final crop to 12,000,000 bales, said Mr. Todd, whereas on the other hand, favorable conditions could raise the total yield to considerably over the government's estimate.

Mr. Todd sees no reason for any one to worry about the carryover. There is not the slightest doubt that it is about 2,000,000 bales more than a year ago, regardless of whatever else has been said. "And this is not one bale more than the world will need," said Mr. Todd. "This carryover will be a savior if the present crop does not turn out any better than the indications at the moment. I have intimated, with boll weevil damage, it is just as possible as not that the final yield could be less. We need a carryover for just such a reason. It may be that we would not be able to do without it next season. If, by the spring of 1928, there is any such condition as the government now shows, the cotton situation and prospects would be serious."

U. S. Exports

Shipments of textile commodities to foreign countries totaled $471,596,000 the first half of 1927, compared with $426,869,000 in 1926, a gain of 10.5 per cent. Raw cotton accounted for 80 per cent of the total value as against 76 per cent in 1926.

Exports of raw cotton, including linters, increased from a total of 3,108,370 bales, value $324,886,000, in 1926 to 5,221,360 bales, with a value of $377,380,000 in 1927 a gain of 68 per cent in quantity and of 16 per cent in value. The latter percentage reflects a decline in the export price from $.2042 per pound in 1926 to $.1409 in 1927.

Europe took 73.8 per cent of the American cotton shipped abroad in 1927 against 78 per cent in 1926. Despite this decline in the proportionate share of the total exports, European purchases rose from a total of 2,424,874 bales in 1926 to 3,851,417 in 1927, a gain of 58.8 per cent.

The largest increases were registered in shipments to Germany and the United Kingdom, the two leading markets for American cotton. Belgium and Soviet Russia in Europe also bought considerably more American cotton in 1927 than in 1926. With the exception of Italy, sales of American cotton to other important consuming markets on the Continent registered moderate gains in 1927 as compared with 1926.

Exports of cotton to Germany, which include a large amount of cotton ultimately destined for other continental countries, mounted from a total of 480,049 bales in 1926 to 1,279,371 in 1927, a gain of 799,322 bales.

Cotton Futures Bill Approved

The Rivers bill, making it legal to do future trading in cotton, provided there is actual delivery, was approved by the judiciary committee No. 1, of the State Senate. The bill was amended so that it would not become effective until one or more delivery points are established in Georgia. Senator Rivers agreed to a committee amendment to his measure, imposing a license fee of $10,000 upon any one who goes out into any county and solicits orders for purchases on margins.

Egyptian Cotton

U. S. Commerce Reports states that world overproduction of cotton, which resulted in lower prices for this staple, coupled with industrial depression in certain countries which are normally the largest consumers of Egyptian cotton subjected Egypt's economic position to a severe test. The actual loss in the value of raw cotton exported during the 1925-26 cotton year, as compared with the previous year, was £E17,355,000 (the Egyptian pound equals approximately $5). The government extended aid during the 1925-26 season by purchasing large quantities of cotton and storing it; but, as these stocks merely swelled the abnormal supplies on hand at the end of the season, the same policy has not been followed during the 1926-27 cotton season. Instead, the government has placed large sums of money at the disposal of the banks in order to supply the farmers with loans on the cotton stored in the banks' warehouses. The final official estimate places the 1926 cotton crop at 1,497,000 bales averaging 478 pounds net, as compared with 1,629,000 bales in 1925.

MEXICAN RUBBER AND CHICLE

The American Chamber of Commerce of Mexico reports that Para rubber is grown in fifteen, guayule rubber in five, and chicle in nine states of the republic. A statement concerning castilloa is lacking, and it is assumed that the latter, which is abundant, has been classed with Para, which is less plentiful. Chicle continues to be shipped in great quantities from Frontera and other ports, chiefly for manufacture into chewing gum. Natives who tap the trees on their own lands or in the forests are said to get 20 cents for 2½ pounds of gum, while brokers at the concentrating points sell it for from 45 to 50 cents a pound. American chewing gum interests own vast tracts of land in Yucatan, Tabasco, and Campeche in which chicle camps have been established; and in the latter two states they have set up plantations of zapote trees covering many thousand acres that are now yielding under expert cultivation a bountiful harvest of chicle.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

	Cases
JULY 14. By "Pres. Harrison," Far East.	
H. A. Astlett & Co	2,264
The Meyer & Brown Corp.....pkgs.	970
JULY 14. By "Steel Navigator," Far East.	
Hood Rubber Co	†66
JULY 17. By "Carmania," Europe.	
Baird Rubber & Trading Co., Inc	141
General Rubber Co	1,059
Littlejohn & Co., Inc	1,168
Charles T. Wilson Co., Inc	177
JULY 18. By "American Merchant," Europe.	
Baird Rubber & Trading Co., Inc	103
Littlejohn & Co., Inc	585
JULY 18. By "City of Salisbury," Far East.	
H. A. Astlett & Co	1,670
Baird Rubber & Trading Co., Inc	1,110
General Rubber Co	1,007
Hood Rubber Co	†387
Littlejohn & Co., Inc	800
The Meyer & Brown Corp.....pkgs.	505
H. Muehlstein & Co., Inc	263
Rogers Brown & Crocker Bros., Inc	200
Rogers Brown & Crocker Bros., Inc	†100
Charles T. Wilson Co., Inc	87
JULY 18. By "Minnekahda," Far East.	
Baird Rubber & Trading Co., Inc	700
General Rubber Co	1,167
Haldane Bierrie & Co., Inc	101
Littlejohn & Co., Inc	1,107
The Meyer & Brown Corp.....pkgs.	78
Charles T. Wilson Co., Inc	36
JULY 18. By "Samaria," London.	
Charles T. Wilson Co., Inc	62
JULY 19. By "Sangamon," Europe.	
General Rubber Co	50
JULY 20. By "Baltic," Far East.	
Baird Rubber & Trading Co., Inc	306
H. Muehlstein & Co., Inc	119
JULY 20. By "Oregon Maru," Far East.	
H. A. Astlett & Co	335
General Rubber Co	3,238
Haldane Bierrie & Co., Inc	665
Littlejohn & Co., Inc	1,499
The Meyer & Brown Corp.....pkgs.	1,255
H. Muehlstein & Co., Inc	414
Rogers Brown & Crocker Bros., Inc	1,102
Charles T. Wilson Co., Inc	324
JULY 22. By "City of Singapore," Far East.	
H. A. Astlett & Co	1,823
Baird Rubber & Trading Co., Inc	1,300
General Rubber Co	4,233
Haldane Bierrie & Co., Inc	540
Hood Rubber Co	384
Littlejohn & Co., Inc	2,741
Meyer & Brown, Inc.....pkgs.	130
The Meyer & Brown Corp.....pkgs.	1,210
H. Muehlstein & Co., Inc	51
Poel & Kelly, Inc	355
Rogers Brown & Crocker Bros., Inc	1,168
Charles T. Wilson Co., Inc	581
JULY 23. By "Devonian," London.	
Baird Rubber & Trading Co., Inc	†103
JULY 25. By "American Trader," Europe.	
General Rubber Co	10,579
JULY 25. By "London Commerce," Europe.	
Baird Rubber & Trading Co., Inc	1,419
General Rubber Co	1,073
Littlejohn & Co., Inc	1,620
JULY 25. By "Minnewaska," Europe.	
Baird Rubber & Trading Co., Inc	175
Littlejohn & Co., Inc	1,345
The Meyer & Brown Corp.....pkgs.	149
JULY 25. By "Nieuw Amsterdam," Europe.	
General Rubber Co	186
Littlejohn & Co., Inc	42
JULY 27. By "Korea Maru," Far East.	
H. A. Astlett & Co	377
JULY 27. By "Mahsud," Far East.	
Baird Rubber & Trading Co., Inc	112
General Rubber Co	1,771
Hood Rubber Co.....bales	†50
Littlejohn & Co., Inc	50
The Meyer & Brown Corp.....pkgs.	1,318
Charles T. Wilson Co., Inc	530
JULY 27. By "President Monroe," Far East.	
H. A. Astlett & Co	500
Baird Rubber & Trading Co., Inc	1,080
General Rubber Co	2,508
Haldane Bierrie & Co., Inc	250
Hood Rubber Co.....bales	†50
Littlejohn & Co., Inc	7,023
The Meyer & Brown Corp.....pkgs.	1,235
H. Muehlstein & Co., Inc	930
Rogers Brown & Crocker Bros., Inc	1,054
Charles T. Wilson Co., Inc	168
JULY 28. By "City of Eastbourne," Far East.	
General Rubber Co	1,008
Littlejohn & Co., Inc	163
JULY 28. By "Port Hacking," London.	
Charles T. Wilson Co., Inc	130
JULY 29. By "Rotterdam," Europe.	
Littlejohn & Co., Inc	169
The Meyer & Brown Corp.....pkgs.	300
Charles T. Wilson Co., Inc	450
JULY 30. By "Belfast Maru," Far East.	
H. A. Astlett & Co	782
General Rubber Co	5,396
Haldane Bierrie & Co., Inc	198
Hood Rubber Co	†251
Littlejohn & Co., Inc	1,856
The Meyer & Brown Corp.....pkgs.	1,121
H. Muehlstein & Co., Inc	742
Poel & Kelly, Inc	178
Rogers Brown & Crocker Bros., Inc	718
Rogers Brown & Crocker Bros., Inc	†100
Charles T. Wilson Co., Inc	339
JULY 30. By "Kangean," Far East.	
H. A. Astlett & Co	374
Baird Rubber & Trading Co., Inc	712
Haldane Bierrie & Co., Inc	1,046
Littlejohn & Co., Inc	3,110
Meyer & Brown, Inc.....pkgs.	161
The Meyer & Brown Corp.....pkgs.	192
H. Muehlstein & Co., Inc	326
Poel & Kelly, Inc	478
Raw Products Co	125
Rogers Brown & Crocker Bros., Inc	92
Charles T. Wilson Co., Inc	361
AUGUST 1. By "Adriatic," Liverpool.	
Baird Rubber & Trading Co., Inc	27
AUGUST 1. By "Laconia," London.	
Baird Rubber & Trading Co., Inc	142
AUGUST 1. By "Tuscania," Europe.	
General Rubber Co	6,117
Littlejohn & Co., Inc	157
AUGUST 2. By "Minnesota," Far East.	
Baird Rubber & Trading Co., Inc	367
General Rubber Co	10,066
Charles T. Wilson Co., Inc	250
AUGUST 3. By "Elpenor," Far East.	
H. A. Astlett & Co	765
Baird Rubber & Trading Co., Inc	1,350
General Rubber Co	4,478
Haldane Bierrie & Co., Inc	441
Littlejohn & Co., Inc	6,261
Meyer & Brown, Inc.....pkgs.	23
The Meyer & Brown Corp.....pkgs.	1,811
H. Muehlstein & Co., Inc	363
Poel & Kelly, Inc	390
Raw Products Co	100
Rogers Brown & Crocker Bros., Inc	†200
Charles T. Wilson Co., Inc	762
AUGUST 5. By "Ambridge," Europe.	
Littlejohn & Co., Inc	65
AUGUST 6. By "Mississippi," London.	
Hood Rubber Co	†282
AUGUST 7. By "Caronia," London.	
Charles T. Wilson Co., Inc	232
AUGUST 7. By "Luceric," Far East.	
General Rubber Co	1,036
Hood Rubber Co	†75
Littlejohn & Co., Inc	492
The Meyer & Brown Corp.....pkgs.	809
AUGUST 8. By "Burgerdyk," Europe.	
Littlejohn & Co., Inc	50
The Meyer & Brown Corp.....pkgs.	50
AUGUST 8. By "Minnetonka," London.	
The Meyer & Brown Corp.....pkgs.	95
Charles T. Wilson Co., Inc	400
AUGUST 8. By "Swinburne," Far East.	
Paul Bertuch & Co., Inc	68
AUGUST 10. By "Astyanax," Far East.	
H. A. Astlett & Co	346
General Rubber Co	3,655
Haldane Bierrie & Co., Inc	393
Littlejohn & Co., Inc	3,164
The Meyer & Brown Corp.....pkgs.	382
H. Muehlstein & Co., Inc	158
Poel & Kelly, Inc	268
Rogers Brown & Crocker Bros., Inc	195
Charles T. Wilson Co., Inc	458
AUGUST 10. By "Chinese Prince," Far East.	
H. A. Astlett & Co	561
Baird Rubber & Trading Co., Inc	770
General Rubber Co	9,522
Haldane Bierrie & Co., Inc	393
Littlejohn & Co., Inc	5,530
The Meyer & Brown Corp.....pkgs.	958
The Meyer & Brown Corp.....pkgs.	†200
H. Muehlstein & Co., Inc	810
Poel & Kelly, Inc	76
Raw Products Co	180
Rogers Brown & Crocker Bros., Inc	1,635
Charles T. Wilson Co., Inc	560
AUGUST 10. By "Forresbank," Far East.	
H. A. Astlett & Co	55
General Rubber Co	1,372
Haldane Bierrie & Co., Inc	288
Littlejohn & Co., Inc	940
The Meyer & Brown Corp.....pkgs.	1,390
H. Muehlstein & Co., Inc	895
Poel & Kelly, Inc	276
Rogers Brown & Crocker Bros., Inc	600
Charles T. Wilson Co., Inc	62
AUGUST 11. By "City of Canton," Far East.	
Baird Rubber & Trading Co., Inc	200
Littlejohn & Co., Inc	1,828
The Meyer & Brown Corp.....pkgs.	300
H. Muehlstein & Co., Inc	336
AUGUST 11. By "President Wilson," Far East.	
H. A. Astlett & Co	2,055
Baird Rubber & Trading Co., Inc	112
General Rubber Co	1,895
Haldane Bierrie & Co., Inc	500
Littlejohn & Co., Inc	3,786
The Meyer & Brown Corp.....pkgs.	1,593
The Meyer & Brown Corp.....pkgs.	†226
H. Muehlstein & Co., Inc	191
Poel & Kelly, Inc	1,829
Raw Products Co	100
Rogers Brown & Crocker Bros., Inc	600
AUGUST 12. By "Masirah," Far East.	
Littlejohn & Co., Inc	112
Charles T. Wilson Co., Inc	298
AUGUST 13. By "Titan," Far East.	
H. A. Astlett & Co	570
Baird Rubber & Trading Co., Inc	403
Haldane Bierrie & Co., Inc	250
Littlejohn & Co., Inc	1,856
The Meyer & Brown Corp.....pkgs.	430
The Meyer & Brown Corp.....pkgs.	†226
H. Muehlstein & Co., Inc	380
Poel & Kelly, Inc	50
Rogers Brown & Crocker Bros., Inc	300
Charles T. Wilson Co., Inc	300
AUGUST 13. By "Volendam," Europe.	
Littlejohn & Co., Inc	24
AUGUST 14. By "Atlanta City," Far East.	
H. A. Astlett & Co	1,395
Baird Rubber & Trading Co., Inc	650
Paul Bertuch & Co., Inc	50
Haldane Bierrie & Co., Inc	100
Littlejohn & Co., Inc	2,882
H. Muehlstein & Co., Inc	246
Rogers Brown & Crocker Bros., Inc	510
Charles T. Wilson Co., Inc	382
AUGUST 14. By "President Lincoln," Far East.	
Poel & Kelly, Inc	*100
AUGUST 15. By "Baltic," Liverpool.	
Baird Rubber & Trading Co., Inc	68
AUGUST 15. By "Minnekahda," Far East.	
Charles T. Wilson Co., Inc	536

* Arrived at Los Angeles.
† Arrived at Boston.

Africans

	Cases
JULY 18. By "Lorain," Europe.	
Littlejohn & Co., Inc	153
JULY 30. By "La Bourdonnais," Europe.	
Littlejohn & Co., Inc	226
AUGUST 1. By "Laconia," Europe.	
Littlejohn & Co., Inc	24
AUGUST 11. By "Napierian," Far East.	
Hood Rubber Co.....bales	118

Guayule

JULY 18. By "Stal," Mexico.	
Continental Rubber Co. of New York	1,060
JULY 24. By "Agwidale," Mexico.	
Continental Rubber Co. of New York	500
JULY 24. By "Mexico," Mexico.	
Baird Rubber & Trading Co., Inc	560
Continental Rubber Co. of New York	1,060
AUGUST 1. By "Canto," Mexico.	
Continental Rubber Co. of New York	2,740
AUGUST 8. By "Montgomery," Mexico.	
Continental Rubber Co. of New York	1,120
AUGUST 13. By "Camaguey," Mexico.	
Continental Rubber Co. of New York	2,240

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
JULY 9. By "Allan," South America.					
H. A. Astlett & Co.	54	...	16	83	...
JULY 25. By "Francis," Brazil.					
H. A. Astlett & Co.	320	2	1	43	...
Paul Bertuch & Co., Inc.	*151	...	...	...	...
Paul Bertuch & Co., Inc.	66	...	...	...	...
General Rubber Co.	794	26	208	36	†17
Littlejohn & Co., Inc.	1,040	46	288	150	...
The Meyer & Brown Corp.	...	...	...	260	...
AUGUST 8. By "Swinburne," Brazil.					
H. A. Astlett & Co.	263	...	73	73	...
Paul Bertuch & Co., Inc.	...	...	...	390	...
General Rubber Co.	34	4	29	836	‡1
Littlejohn & Co., Inc.	196	7	287	200	...

* Pelles. † Cameta. ‡ Mixed.

United States Crude and Waste Rubber Imports for 1927 by Months

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1927	Total 1926	Balata	Miscellaneous	Waste
January ..... *tons*	42,646	2,378	269	299	144	...	45,736	38,697	106	1,508	447
February	25,326	1,668	213	207	190	...	27,600	34,067	119	935	953
March	33,114	1,176	206	253	329	...	35,078	42,677	82	674	531
April	45,843	1,822	351	229	418	10	48,673	32,678	109	1,317	631
May	33,735	1,872	197	399	364	2	36,569	30,411	68	1,075	1,056
June	31,444	1,057	123	251	317	2	33,194	30,107	85	1,092	230
July	37,060	871	46	388	295	7	38,667	37,087	66	1,030	62
Total, 7 months, 1927....*tons*	249,168	10,844	1,405	2,022	2,057	21	265,517	.....	635	7,631	3,910
Total, 7 months, 1926....*tons*	230,514	7,875	1,997	2,849	2,463	26	.....	245,724	281	6,612	3,249

Compiled from statistics supplied by the Rubber Association of America, Inc.

World Rubber Production (Net Exports)

Long Tons 1927

	Jan.	Feb.	March	April	May	June	July
British Malaya	19,951	15,921	23,882	15,972	15,902	17,901	11,250
Ceylon	6,697	3,571	7,142	3,349	3,124	3,348	.....
India and Burma	921	1,469	1,124	723	760	856	.....
Sarawak	959	552	997	984	786	1,100	.....
British Borneo	*500	*500	*500	*500	*500	*500	.....
Siam	304	360	432	526	348	409	.....
Java and Madura	4,184	4,707	5,657	4,666	5,430	4,818	.....
Sumatra East Coast	6,705	6,526	7,003	5,530	5,528	5,519	.....
Other D. E. Indies	10,541	10,634	12,490	10,035	14,099	9,402	.....
French Indo-China	941	675	733	557	586	772	519
Amazon Valley	2,885	2,082	3,203	2,374	2,431	1,030	1,713
Other America	217	174	149	177	.....	.....	.....
Mexican Guayule	292	426	455	491	399	400	.....
Africa	472	498	1,187	827	.....	.....	.....
Totals	55,569	48,095	64,954	46,711	.....	.....	.....

* Estimate.

World Rubber Absorption—Net Imports

Long Tons 1927

	Jan.	Feb.	Mar.	Apr.	May	June
Australia	929	460	780	762	694	557
Belgium	296	502	454	448	633	....
Canada	1,936	2,620	3,760	1,509	2,519	2,086
Czechoslovakia	100	210	127	218	223	....
Denmark	52	27	76	27	75	....
Finland	47	65	44	34	76	....
France	3,284	3,263	2,050	2,310	2,006	2,387
Germany	2,481	3,103	3,475	2,393	3,380	3,632
Italy	672	601	852	781	918	....
Japan	1,227	1,902	1,578	2,181	1,084	798
Netherlands	181	153	86	58	—57	—16
Norway	53	53	46	33	42	....
Russia	803	907	784	1,972	887	1,506
Spain	139	146	137	177	155	....
Sweden	164	191	219	136	142	....
United Kingdom	10,191	7,692	9,049	7,875	2,896	2,282
United States	41,814	25,886	32,751	44,627	33,761	31,270
United States (Guayule)	292	426	455	491	399	400
Totals	64,661	48,207	56,723	66,032	49,833	....

— Minus quantity; excess of exports over imports.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

FARMERS EXACTING TIRE BUYERS

An impression that selling tires to farmers is much easier than vending them among city men is challenged by a salesman of wide experience. He says that city buyers do not know tires as well as they should, they are easily persuaded to buy articles of inferior grade, and having repairs made at a garage they learn little about what goes into a tire. Fully 90 per cent of farmer buyers, it is claimed, do their own repairing, utilizing various kits, tire savers, blowout patches, etc., and that through this means, as well as through practical tests on all sorts of country roads, they get a much better idea of tire quality than do most city men.

TIRE INVENTORY — PRODUCTION — DOMESTIC SHIPMENTS

The month of June showed an increase over May in inventory, production and shipments of all types of tires with the single exception of production of solid and cushion tires. Inventory and production of inner tubes showed a decline, the figures for shipments, however, showing a gain. The totals for tires show a considerable gain over those for the corresponding month in 1926, with the exception of inventory for solid and cushion tires, while the figures for tubes show a gain in production and a loss in inventory and shipments.

The June figures for pneumatic casings reached a total of 9,346,923 in inventory, 4,659,195 in production, and 4,690,393 in shipments, against May's totals of 9,346,581, 4,613,945 and 4,243,078. Inner tube figures for June inventory were 13,393,897 against May's total of 13,792,496; production 4,729,830 against 5,053,018; shipments 5,124,264 against 4,605,277.

The June consumption of cotton fabric in the manufacture of casings, tubes, solid and cushion tires was 17,443,168 pounds, with crude rubber consumption in the same manufacture, 48,777,912 pounds.

	June, 1927		
	Inventory*	Production	Total Shipments
Pneumatic casings—all types	9,346,923	4,659,195	4,690,393
Inner tubes—all types	13,393,897	4,729,830	5,124,246
Balloon casings	4,467,148	2,744,363	2,374,345
Balloon inner tubes	6,256,281	2,794,164	2,328,152
High pressure cord casings	4,407,054	1,884,149	2,202,930
High pressure inner tubes	7,137,616	1,935,666	2,796,094
Solid and cushion tires	182,835	61,165	55,338

COTTON AND CRUBE RUBBER CONSUMPTION IN TIRES AND TUBES

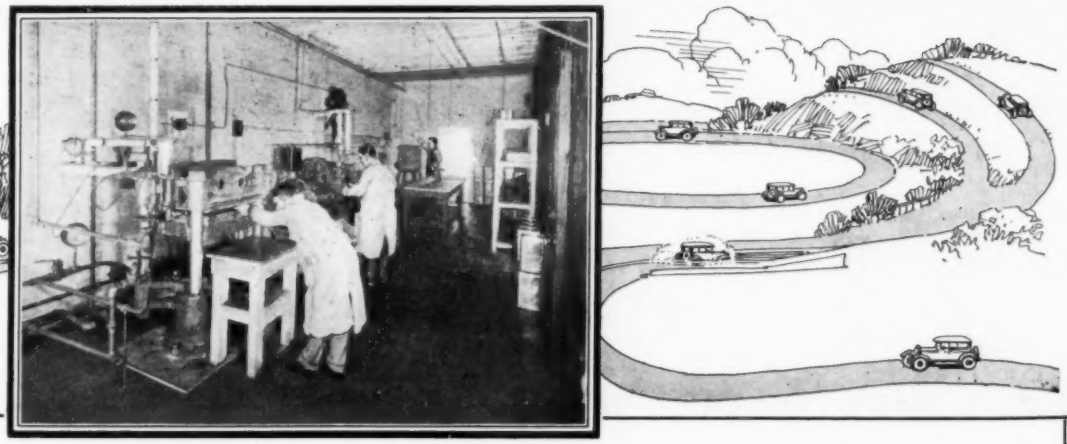
	Pounds
Cotton fabric	17,443,168
Crude rubber	48,777,912

*As of June 30, 1927.
Rubber Association figures representing 75 per cent of the industry.

INSTITUTE OF CHEMISTRY

At the Institute of Chemistry held recently by the American Chemical Society at State College, Pennsylvania, there were papers of special interest to rubber chemists notably those on particle size.

Determination of particle size was discussed by S. E. Sheppard of the Eastman Kodak Co.; Henry Green of the New Jersey Zinc Co.; Victor Cofman of the du Pont Co.; Elwood Spear of The Thermatomic Carbon Co.; and H. N. Holmes of Oberlin College.



CABOTS'
"Proving Ground"

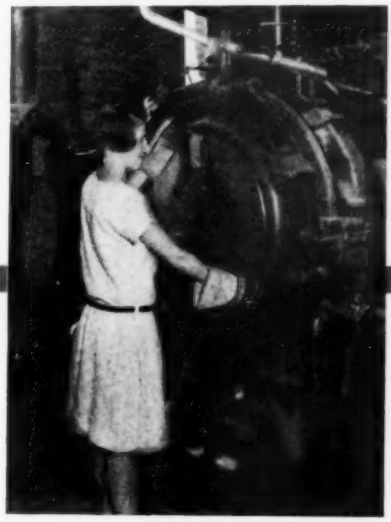
LEADERS in the automobile industry no longer wait to try out an innovation on the public. They try it out thoroughly under all operating conditions on their own proving ground.

That is the reason Godfrey L. Cabot, Inc., has established a "proving ground" on which they can try out innovations and maintain the high standard of their product.

All day long rubber samples are compounded, cured, and tested in their laboratory, to eliminate the inferior and promote the superior qualities of the carbon black which Cabot makes and sells.

Carbon Black

GODFREY L. CABOT, INC.
940 Old South Building, BOSTON.



The Master is Built in Both Vertical and Horizontal Models

So Easy and Simple That Girls Can Operate

These pictures show one of the numerous batteries of Master Tube Vulcanizers that daily are producing full molded tubes on a new low cost basis.

Operated by girls? Of course! The Master was designed and built to provide the greatest ease and simplicity in operation, as well as unfailing uniformity and reliability in vulcanizing.

Producing perfect full molded tubes faster, and with marked savings in curing room labor costs, is made a certainty with this full automatic equipment. The operator has only to take out the cured tube and put in the uncured tube.

The Master opens and closes, locks and unlocks itself which makes it possible for a girl to operate.

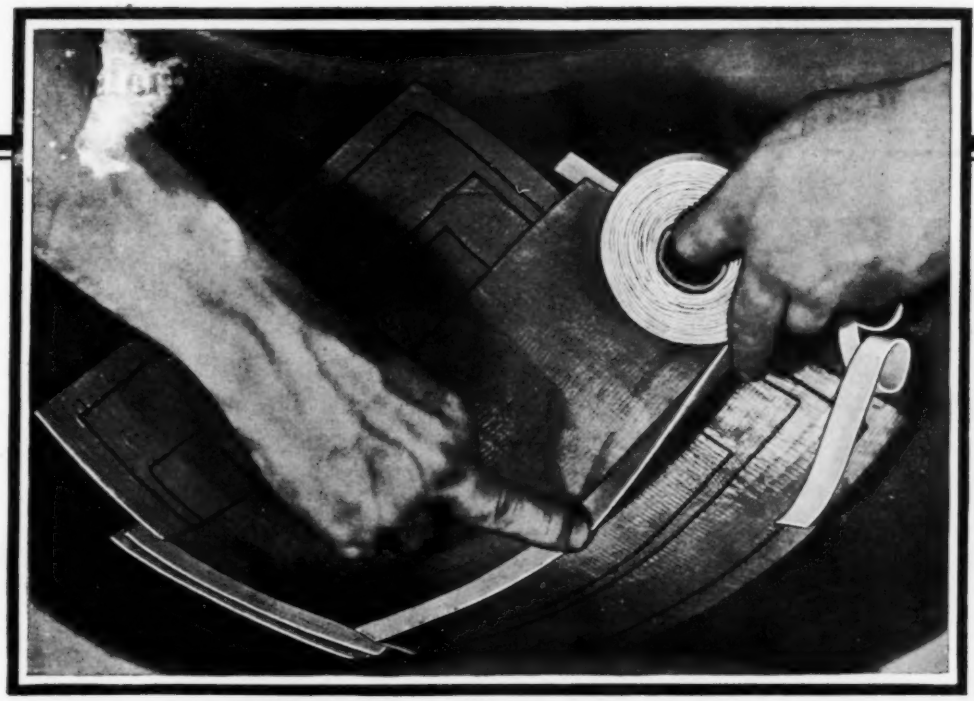
The complete operation takes just a few seconds. Each vertical Unit is double, having two complete molds. The Master is economical of floor space and every part used in its construction is designed to assure long wear and low maintenance costs.

With this proven equipment in your plant and the definite information on proper stocks and methods worked out by our Engineering Staff, the profitable production of Full Molded Tubes is assured.

Prices On Application

The Akron Standard Mold Co.

Akron — "The Established Measure of Value" — Ohio



The Mark of Quality

New Firestone DEVELOPMENT

SPEEDS UP REPAIRING—SAVES MATERIAL

Gum Strips, already cut for you in 1/2-inch widths, and rolled like friction tape, ready to use instantly, without waste—this is the latest improvement in repair materials worked out by Firestone Engineers, in the factory repair shops. Rolls are cut from finest Firestone cushion gum stock of 1/32-inch gauge. 2-pound cartons contain eight 4-ounce rolls, individually wrapped in lead foil. This enables you to know exactly how much material you use on each job—a great convenience and a great saver of material.

Here is another example of the help that Firestone Repair Materials and Equipment are giving tire men. Ask the Firestone Salesman about it. Or write the nearest Branch or the factory at Akron.

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER . . Harvey S. Firestone

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

CHEMIST, EIGHT YEARS' EXPERIENCE IN RESEARCH COMpounding, plant control for druggists' sundries, vapor cure goods, tires and tubes, desires a change. Address Box No. 8926, care of THE INDIA RUBBER WORLD.

POSITION WANTED AS EXPERT COST ACCOUNTANT OR ASsistant factory manager. Fifteen years' experience in mechanical rubber goods, braided and molded hose, belting, packing, molded goods, etc. Address Box No. 8935, care of The India Rubber World.

MECHANICAL RUBBER SALESMAN, METROPOLitan District. Twenty years in this line. Now open for immediate connection. Address Box No. 8937, care of The India Rubber World.

WANTED: POSITION AS BRANCH MANAGER OR SALESMAN by man with over twenty years' experience in mechanicals, clothing, drug sundries and specialties. Now employed, but desires a change to a firm offering a good future. Address Box No. 8939, care of THE INDIA RUBBER WORLD.

GENERAL FOREMAN OF COMPOUND MILL AND calender departments. Seventeen years' practical experience, best of references as to ability and efficiency. Address Box No. 8940, care of THE INDIA RUBBER WORLD.

AFTER OCTOBER 1, I AM OPEN FOR A PROPOSITION. HAVE had over ten years' experience in manufacturing rubber products, factory and office. Willing to invest some capital. Address Box No. 8941, care of THE INDIA RUBBER WORLD.

COLLEGE GRADUATE, SEVERAL YEARS' EXPERIENCE IN rubber factory as superintendent, desires to associate himself with progressive concern. Address Box No. 8942, care of THE INDIA RUBBER WORLD.

SUPERINTENDENT OR ASSISTANT. EXPERIENCED ON ALL types of spreader and calender work. Raincoat, leatherette, sheet rubber, sanitary articles, etc. Address Box No. 8944, care of THE INDIA RUBBER WORLD.

GRADUATE CHEMIST WITH MANY YEARS' PRACtical experience in the various branches of the rubber industry, now employed, desires new connection with progressive concern. Thoroughly competent in compounding, factory control, development work, research and general rubber technology. Conscientious worker, proven producer. Highest references. Address Box No. 8945, care of THE INDIA RUBBER WORLD.

CALENDER MAN EXPERIENCED ON HIGH GRADE RUBBER and other fine work would like position with some reliable concern. Address Box No. 8946, care of THE INDIA RUBBER WORLD.

FACTORY EXECUTIVE, FORTY-THREE YEARS OLD, SIXTEEN years' experience as superintendent, brake lining, solid and pneumatic tires, also general mechanical goods. References from past employers. Moderate salary. Address Box No. 8947, care of THE INDIA RUBBER WORLD.

SALESMAN MANAGER, AGE THIRTY-EIGHT, DESIRES CONNECtion with reliable mechanical rubber goods manufacturer. Acquainted with New York and Pacific Coast trade. Qualified to operate branch. Address Box No. 8949, care of THE INDIA RUBBER WORLD.

TECHNICAL COLLEGE GRADUATE, AGE TWENTY-EIGHT, eight years' experience in research, compounding, plant control, as assistant to technical director of eastern mechanical goods company. Desires permanent connection either in similar capacity, or sales or executive work requiring technical ability. Excellent references. Address Box No. 8951, care of THE INDIA RUBBER WORLD.

SALES MANAGER, AGE THIRTY-SEVEN, EXPERIENCED IN mechanical rubber goods making soles, heels, mattings and molded goods, desires connection. Address Box No. 8952, care of THE INDIA RUBBER WORLD.

DEVELOPMENT ENGINEER AND CHEMIST, TEN YEARS' EXperience, tires, mechanicals, floor tiling. Expert in compounding, designing molds, factory process and general factory management. Address Box No. 8955, care of THE INDIA RUBBER WORLD.

CHEMIST AND EXECUTIVE WITH MANY YEARS' MANUFACturing experience in laboratory, factory and office in several branches of the rubber industry, wishes to make connection with a small rubber company in a suitable executive capacity. New and novel line of blown rubber goods manufactured by patented process. Address Box No. 8956, care of THE INDIA RUBBER WORLD.

(Advertisements continued on page 66)

Classified Advertisements

CONTINUED

SITUATIONS OPEN

WANTED—AN EXPERIENCED CHEMIST TO TAKE CHARGE of laboratory and compounding on high grade soles and heels. Prefer man with engineering aptitude. Good opportunity for the right man. In applying please furnish reference, stating age, whether married or single, also the training and experience you have had. Address Box No. 8931, care of THE INDIA RUBBER WORLD.

DEVELOPMENT ENGINEER WANTED BY LARGE RUBBER manufacturer in Akron, Ohio. Applicant must have at least five years' experience in the development of mechanical goods. In reply state age, experience and salary desired. Address Box No. 8932, care of The India Rubber World.

MECHANICAL MOLDED GOODS EXECUTIVE: WE HAVE A position open for a high class executive in our mechanical molded goods department. He must be capable of producing the highest class of merchandise. Give full information regarding experience, whether married or single, salary expected, etc., in your first letter. Address Box No. 8934, care of The India Rubber World.

WANTED: MECHANICAL GOODS COMPOUNDER EXPERIENCED specification hose and general molded goods by established western manufacturer. In reply give in full: experience, salary expected and references. All information will be held confidential. Address Box No. 8936, care of The India Rubber World.

WANTED: A FIRST CLASS SALES MANAGER FOR MECHANical rubber goods factory. Give experience, age, mills worked for, number of salesmen handled and volume of business. Address Box No. 8953, care of THE INDIA RUBBER WORLD.

(*Advertisements continued on page 68*)

Classified Advertisements

CONTINUED

BUSINESS OPPORTUNITIES

RUBBER FORMULAS: FOR DIPPED GOODS WITH INSTRUCtions where to buy equipment and make the goods; reclaiming inner tubes process; long life airbags, how to make and handle them; balloon tire complete. Everything in rubber. Write for our new list. Rubber Compound Bureau, 727 Second National Building, Akron, Ohio.

FACTORY FOR SALE OR RENT, ON LONG ISLAND, FIFTY miles from New York City. Fully equipped rubber footwear factory, including lawn tennis and sport shoes. Could be turned into hard rubber or tire and tube factory by installing a little additional machinery. Henry S. Mott, Northport, New York. Phone 366, Northport, Long Island.

SCRAP RUBBER

Spaniard, in a position to sell annually some fifteen million pounds of scrap rubber, well acquainted with clientele in Spanish market and capable of organizing a syndicate of grinding manufacturers, would associate with merchant having large stocks and willing to export.

He can also come to this country to organize the business. Write to

L. Sanz, Capella-4-(Guinardo) Barcelona (Spain)

FOR SALE: RUBBER FACTORY, THREE-STORY BRICK BUILDing, entirely remodeled recently. Situated about ninety miles from New York and twenty-five miles from Philadelphia on the Reading R. R. Plant equipped to make rubber balls, toys, etc. Address Box No. 8950, care of THE INDIA RUBBER WORLD.

FOR SALE

Modern Rubber Plant situated in New York City approximately 65,000 square feet of light floor space—latest slow burning mill construction 100% sprinklered; sufficient land for expansion.

Gryphon Rubber & Tire Corporation
Bailey Avenue and 192nd Street, New York City

M. NORTON & COMPANY
MEDFORD, MASS.
New, Old, Cured and Uncured Scrap Rubber
ALL KINDS SECOND HAND RUBBER
MILL MACHINERY BOUGHT AND SOLD
Office and Warehouse, Locust Street, Medford, Mass.

(*Advertisements continued on page 70*)

A COMPLETE modern plant equipped to furnish Basic and Special Rubber Manufacturing and Reclaiming Machinery of practical design and superior quality from the drawing board to the finished machines. Everything is done within our plant under one supervision. In addition to a complete line of Rubber Machinery, we also make all kinds of heavy Gears, spur, herringbone, etc. as well as chilled iron and steel Rolls, turned, ground, polished and crowned or corrugated for Washers, Mixers, Mills, Refiners, Crackers, Calenders, etc. etc. Whatever your requirements, we solict your inquiries.

The Adamson Machine Company

Engineers, Machinists, Iron and Steel Founders

AKRON — OHIO

Classified Advertisements

CONTINUED

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: USED MILLS, CALENDERS, CHURNS, TUBING machines, vulcanizers, presses, etc., all in fine condition. Write for prices and full descriptions. Address Box No. 8927, care of THE INDIA RUBBER WORLD.

ELECTRICAL EQUIPMENT FOR IMMEDIATE DELIVERY, MILL line motors, 220-volt, 440-volt, 2200-volt. Calender motors, D.C., variable speed. Motor generator sets. Tube machine motors. Most complete stock anywhere. Use our experience. Address Box No. 8928, care of THE INDIA RUBBER WORLD.

FOR SALE: FIFTEEN BIRMINGHAM AND FARREL RUBBER mills, two heavy duty W. & P. mixers; three vacuum shelf driers; two No. 27 Banbury mixers. Address Box No. 8929, care of The India Rubber World.

FOR SALE

Two 36-inch by 36-inch 7-Platen Hydraulic Presses, steel plates, 2,000 pounds, new.

FARREL FOUNDRY & MACHINE CO.
Ansonia, Conn.

FOR SALE: BIRMINGHAM MILL 16 BY 40, GOOD AS NEW AND ready for immediate operation. Price $450.00. Address Box No. 8948, care of THE INDIA RUBBER WORLD.

42 BRITISH BUILT SPREADING MACHINES (20 RIGHT, 22 LEFT-hand drives). Two speeds and reverse. Roll width 64 inches. Steam platen 12 feet 6 inches long, tested to 30 pounds per square inch. Scrape and three-knife revolving gages. Installed 1917-18; done little work; condition good. Price $450.00 each at factory. Packing and delivery to British Port extra and can be arranged at cost. Address Box No. 8954, care of THE INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

DESIRE TO PURCHASE COMPLETE LINE FULL OVERSIZED high pressure and also complete line balloon tire molds. Address Box No. 8957, care of THE INDIA RUBBER WORLD.

WANTED: TWO VACUUM DRIERS; THREE HEAVY DUTY MIXers; two Birmingham mills. Address Box No. 8930, care of THE INDIA RUBBER WORLD.

(Advertisements continued on page 72)

Classified Advertisements

CONTINUED

MACHINERY AND SUPPLIES WANTED

WANTED: UPPER CALENDER, 12 BY 32 FARREL. MUST BE in good mechanical condition and late model. State serial number, condition, equipment and lowest cash price. Address Box No. 8933, care of The India Rubber World.

WANTED: ONE 250 GALLON STEAM JACKETED DIGESTER or kettle, to stand 250 pounds steam pressure on jacket and shell, with propeller agitator and 8-inch bottom opening; two rubber crackers; two rubber refiners; two 40-inch rubber mills. Must be in first class shape. Address Box No. 8938, care of THE INDIA RUBBER WORLD.

WANTED: ONE 30 OR 36-INCH THREE-ROLL STOCK AND friction calender, one 12 or 15 by 36-inch rubber mill, ratio about 1.20 to 1. Give full details and price in first letter. Address Box No. 8943, care of THE INDIA RUBBER WORLD.

BUYERS' GUIDE

Alphabetical list of the advertisers manufacturing rubber goods, rubber machinery, equipment, supplies and compounding ingredients. If unable to find what you want, communicate with us and we will try to help you.

ACCELERATORS.

American Cyanamid Co., New York.
Dovan Chemical Corporation, New York.
Du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Naugatuck Chemical Co., Naugatuck, Conn.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories Co., The, Akron, Ohio.
Vanderbilt, R. T., Co., New York.
Wishnick-Tumpeer, Inc., New York.

ACCESSORIES—Automobile.

Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Limited, Toronto, Canada.
United States Rubber Co., New York.

ACCUMULATORS—Hydraulic.

Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Burroughs Co., The, Newark, N. J.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

ACIDS.

Grasselli Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Wishnick-Tumpeer, Inc., New York.

AIRPLANE CLOTHS.

Hodgman Rubber Co., Framingham, Mass.
United States Rubber Co., New York.

ANTIMONY—Golden and Crimson.

Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Naugatuck Chemical Co., Naugatuck, Conn.
Rare Metal Products Co., Belleville, N. J.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer, Inc., New York.

ANTIOXIDANT.

Hall, C. P., Co., The, Akron, Ohio.
Naugatuck Chemical Co., Naugatuck, Conn.
Vanderbilt, R. T., Co., New York.

APRONS—Rubber.

Archer Rubber Co., Milford, Mass.
Chicago Rubber Clothing Co., Racine, Wisconsin.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, O.
Hodgman Rubber Co., Framingham, Mass.
Omo Manufacturing Co., Middletown, Conn.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Schwarzwaelder Co., The, Philadelphia, Pa.
United States Rubber Co., New York.

ASBESTINE.

Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
International Pulp Co., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

AUTO TOP FABRICS.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Plymouth Rubber Co., Inc., Canton, Mass.
Toledo Auto Fabrics Co., Toledo, Ohio.
United States Rubber Co., New York.

BALATA.

Astlett, H. A., & Co., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., New York.
Hardy, R. S., Co., New York.
Jacoby, Ernest, Boston, Mass.
Nordmann, Rassmann & Co., Hamburg, Germany.

BALLOONS—Toy.

Faultless Rubber Co., Ashland, O.
Tovcraft Rubber Co., The, Ashland, Ohio.

BALLS—Golf.

Faultless Rubber Co., Ashland, O.
United States Rubber Co., New York.

BALLS—Tennis.

Faultless Rubber Co., Ashland, O.
Pennsylvania Rubber Co., Jeannette, Pa.

BALLS, DOLLS AND TOYS.

Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, O.
Seamless Rubber Co., Inc., The, New Haven, Conn.
United States Rubber Co., New York.

BANKING.

International Acceptance Bank, Inc., New York.

BARYTES.

Chrystal, Charles B., Co., Inc., New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
McNulty, Joseph A., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

BATH SPRAY HEADS.

Brass Goods Mfg. Co., Brooklyn, N. Y.

BATHING CAPS.

Canfield Rubber Co., Bridgeport, Conn.
Faultless Rubber Co., Ashland, O.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

BEAD BRAID WIRE—Flat.

National-Standard Co., Niles, Mich.

BEAD FLIPPERS.

Utility Manufacturing Co., Cudahy, Wis.

BELT FOLDING MACHINES.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

BELTING—Rubber.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Empire Tire & Rubber Corp., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

BENZOL.

Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer, Inc., New York.

BLANC FIXE.

Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

BLANKETS—Printers'.

Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
United States Rubber Co., New York.

BOILERS.

Biggs Boiler Works, Akron, O.
Thropp, William R., Sons' Co., Trenton, N. J.

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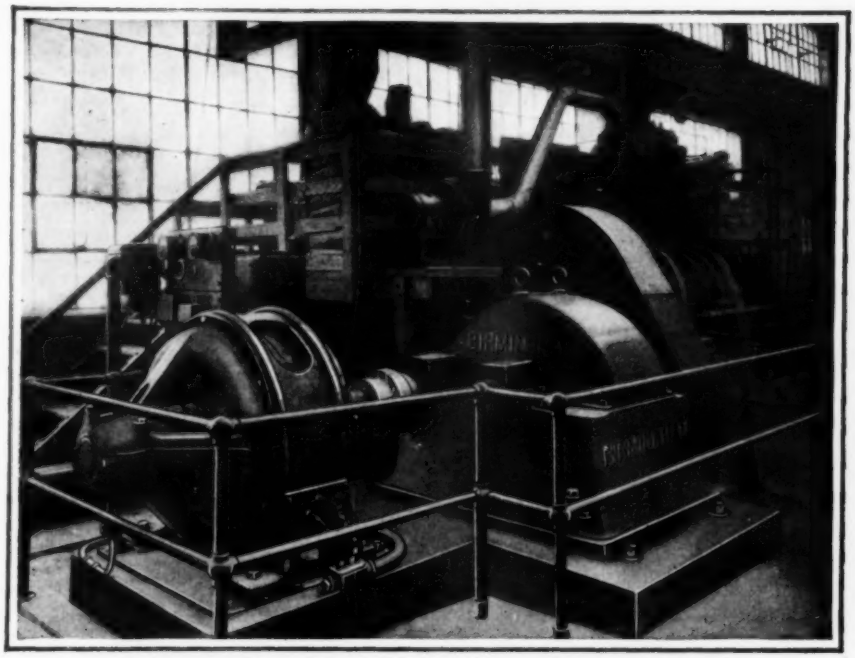

150-horsepower 0.8-power factor, 720-r.p.m. G-E synchronous motor driving Banbury Mixer for Boston Woven Hose and Rubber Company, Cambridge, Mass.

A Winning Drive

G-E Synchronous Motor for an Internal Mixer

Internal mixers in the rubber industry perform a duty which requires exceptionally sturdy driving units. Essential features of the units are high efficiency, ample torque, adequate reserve capacity to care for peak loads, unfailing dependability for 24-hour-day operation, and a simple type of control.

G-E synchronous motors meet all these requirements. Their performance in the rubber industry is proof that when a G-E synchronous motor is installed, the most efficient drive is assured.

Synchronous Motors

G-E synchronous motors are made with the same high standard of quality which is characteristic of all other apparatus identified by this monogram.

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GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

BUYERS' GUIDE

BOOTS AND SHOES.
Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Footwear Co., Hudson, Mass.
Gutta Percha & Rubber, Limited, Toronto, Canada.
United States Rubber Co., New York.

BRAIDERS—Hose.
New England Butt Co., Providence, R. I.

BRAKE LINING—Asbestos.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Thermoid Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

BRUSHING MACHINES AND BRUSHES.
Curtis & Marble Mach. Co., Worcester, Mass.

BUFFING MACHINES.
Banner Machine Co., The, Columbiana, Ohio.
Utility Manufacturing Co., Cudahy, Wis.
Williams Foundry & Machine Co., The, Akron, Ohio.

BULBS.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

BURRS—Heel.
Sessions, J. H., & Son, Bristol, Conn.

CADMIUM YELLOW.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Wishnick-Tumpeer, Inc., New York.

CALENDER SCREW-DOWN — Motor Driven.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

CALENDERING.
Archer Rubber Co., Milford, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Hodgman Rubber Co., Framingham, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

CALENDERS.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Thropp, William R. Sons, Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

CALENDERS—Brake Lining.
Black Rock Mfg. Co., The, Bridgeport, Conn.

CALENDERS—Embossing.
Birmingham Iron Foundry, Derby, Conn.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

CARBON BISULPHIDE.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Wishnick-Tumpeer, Inc., New York.

CARBON BLACK.
Binney & Smith Co., New York.
Cabot, Godfrey L., Inc., Boston, Mass.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

CASTINGS.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
De Mattia Brothers, Inc., Clifton, N. J.
Farrel Foundry and Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams Foundry & Machine Co., Akron, Ohio.

CAUSTIC SODA.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Wishnick-Tumpeer, Inc., New York.

CEMENT—Rubber.
Dominion Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Montgomery Bros., Inc., Philadelphia, Pa.
United States Rubber Co., New York.

CHEMISTS—Consulting Rubber.
Haertel, H. R., Wrentham, Mass.
Maywald, F. J., Dr., Belleville, N. J.
Olin Laboratories, R. R., Akron, O.

CHINA CLAY.
Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Taintor Co., The, New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

CHROMIUM—Oxide.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Waldo, E. M. & F., Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

CHUCKS—Automatic Core.
De Mattia Brothers, Inc., Clifton, N. J.

CLICKING MACHINES.
Hamlin Machine Co., Lynn, Mass.
United Shoe Machinery Corp., Boston, Mass.

CLOTHING—Waterproof.
Archer Rubber Co., Milford, Mass.
Badger Raincoat Co., Port Washington, Wis.
Chicago Rubber Clothing Co., Racine, Wisconsin.
Clifton Mfg. Co., Boston, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Hodgman Rubber Co., Framingham, Mass.
Pirelli, Milan, Italy.
United States Rubber Co., New York.

CLUTCH BRAKES—Pneumatic.
Birmingham Iron Foundry, Derby, Conn.

CLUTCHES—Friction.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry and Machine Co., Ansonia, Conn.
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

CLUTCHES AND BRAKES—Magnetic.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
General Electric Co., Schenectady, N. Y.

COLORS.
Anit & Wiborg Co., New York.
Binney & Smith Co., New York.

COLORS (Continued).
Chrystal, Charles B., Co., Inc., New York.
Grasselli Chemical Co., New York.
Grasselli Dyestuff Corp., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
McNulty, Joseph A., New York.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories Co., The, Akron, Ohio.
Scheel, William H., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Westmoreland Chem. & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

COLORS—Balloon.
Grasselli Chemical Co., New York.

COMBS.
American Hard Rubber Co., New York.
Seamless Rubber Co., Inc., The, New Haven, Conn.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

COMPRESSORS—Air.
Williams Foundry and Machine Co., Akron, Ohio.

CONNECTORS—Air.
Akron Standard Mold Co., Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.

CONTROLLERS—Electrical.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

CONTROLLERS—Temperature.
Bristol Co., The, Waterbury, Conn.
Taylor Instrument Cos., Rochester, N. Y.

CORD—Pure Rubber.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Gutta Percha and Rubber, Ltd., Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

COTTON GOODS.
See Ducks and Drills,
Osnaburgs,
Sheetings,
Tire Fabrics.

COUPLINGS—Flexible and Rigid.
Birmingham Iron Foundry, Derby, Conn.
Falk Corporation, Milwaukee, Wis.
Farrel Foundry & Machine Co., Ansonia, Conn.

CRACKERS.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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BUYERS' GUIDE

CRANES.
Southwark Foundry & Machine Co., Philadelphia, Pa.

CRANES—Hydraulic.
Watson-Stillman Co., The, New York.

CUTTERS—Band.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Utility Manufacturing Co., Cudahy, Wis.

CUTTERS—Bias.
Birmingham Iron Foundry, Derby, Conn.
Spadone Machine Co., Inc., New York.

CUTTERS—Crude Rubber.
Farrel Foundry & Machine Co., Ansonia, Conn.
Peerless Machine Co., The, Racine, Wis.
Southwark Foundry & Machine Co., Philadelphia, Pa.

CUTTERS—Scrap Rubber.
Taylor, Stiles & Co., Riegelsville, N. J.

CUTTERS—Sole.
Wellman Co., Medford, Mass.

CUTTERS—Strip.
Birmingham Iron Foundry, Derby, Conn.
Cameron Machine Co., Brooklyn, N. Y.
New England Butt Co., Providence, R. I.

CUTTERS—Tire.
Adamson Machine Co., The, Akron, Ohio.
Banner Machine Co., Columbiana, Ohio.
Peerless Machine Co., The, Racine, Wis.

DENSIMETERS.
Stowe & Woodward Co., Newton Upper Falls, Mass.

DENTAL GUM.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

DENTAL RUBBER DAM.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Framingham, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

DEVULCANIZERS.
Biggs Boiler Works Co., The, Akron, Ohio.
Struthers-Wells Co., Warren, Pa.

DIE SINKING AND ENGRAVING.
Burroughs Co., The, Newark, N. J.

DIEING OUT MACHINES.
Hamlin Machine Co., Lynn, Mass.

DIES.
Akron Equipment Co., The, Akron, Ohio.
Burroughs Co., The, Newark, N. J.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Mechanical Mold & Machine Co., The, Akron, Ohio.

DIES (Continued).
Terkelsen Machine Co., Boston, Mass.
Williams Foundry & Machine Co., Akron, Ohio.

DIPPED GOODS.
Faultless Rubber Co., Ashland, O.
Seamless Rubber Co., New Haven, Conn.

DIPPED GOODS FORMS.
Colonial Insulator Co., The, Akron, Ohio.
Seville Porcelain Co., Seville, O.

DOUBLING MACHINES.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Utility Manufacturing Co., Cudahy, Wis.

DRESS SHIELD MATERIAL.
Archer Rubber Co., Milford, Mass.
Archer Strauss Rubber Co., Framingham, Mass.
Hodgman Rubber Co., Framingham, Mass.
Ome Manufacturing Co., Middleton, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Schwarzwaelder Co., The, Philadelphia, Pa.
United States Rubber Co., New York.

DRIERS—Coil.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.

DRIERS—Cloth.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

DRIVES—Worm.
De Laval Steam Turbine Co., The, Trenton, N. J.

DRUMS—Bead.
De Mattia Brothers, Inc., Clifton, N. J.

DRUMS—Tire Building.
De Mattia Brothers, Inc., Clifton, N. J.
Utility Manufacturing Co., Cudahy, Wisconsin.

DRYING MACHINES.
American Process Co., New York.
Birmingham Iron Foundry, Derby, Conn.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.
Carrier Engineering Corp., Newark, N. J.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

DUCKS AND DRILLS.
Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Curran & Barry, New York.
Lane, J. H., & Co., New York and Chicago.

DUROMETERS.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

ENGINEERS—Consulting Rubber.
Dunbar, Wilmer, Greensburg, Pa.

ENGINEERS—Rubber Plant.
Consulting Co., The, Cincinnati, Ohio.

ERASERS.
Faultless Rubber Co., Ashland, O.

EXPERIMENTAL WORK.
Maywald, F. J., Belleville, N. J.

EYELETTING MACHINES.
United Shoe Machinery Corporation, Boston, Mass.

FACTICE.
See Rubber Substitutes.

FINGER COTS.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

FIXTURES — Hot Water Bottle, Combination.
Brass Goods Mfg. Co., Brooklyn, N. Y.
Davidson Rubber Co., Boston, Mass.

FLOCK—COTTON.
Claremont Waste Mfg. Co., Claremont, N. H.

FLOORING.
Manhattan Rubber Mfg. Co., The, Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
Stedman Products Co., South Braintree, Mass.
United States Rubber Co., New York.

FOSSIL FLOUR.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.

GAGES—Hardness.
Pusey and Jones Corporation, The, Wilmington, Delaware.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.
Stowe & Woodward Co., Newton, Upper Falls, Mass.

GAGES—Pressure.
Bristol Co., The, Waterbury Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Taylor Instrument Co., Rochester, N. Y.
Utility Manufacturing Co., Cudahy, Wis.

GAGES—Thickness.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Randall, Frank E., Waltham, Mass.

GASKETS.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield, H. O., Co., Bridgeport, Conn.
Dominion Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Hewitt Rubber Co., Buffalo, N. Y.
Hodgman Rubber Co., Framingham, Mass.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
Toycraft Rubber Co., The, Ashland, O.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

GAUGES—Tire Pressure.
Schrader's, A., Sons, Inc., Brooklyn, N. Y.

GEAR CUTTING.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

GEARS.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

GEARS—Helical.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

GEARS—Herringbone.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

GEARS—Reduction.
Birmingham Iron Foundry, Derby, Conn.
De Laval Steam Turbine Co., The, Trenton, N. J.
Farrel Foundry & Machine Co., Ansonia, Conn.
Utility Manufacturing Co., Cudahy, Wis.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

GEARS—Worm.
De Laval Steam Turbine Co., The, Trenton, N. J.
Utility Manufacturing Co., Cudahy, Wis.

GILSONITE.
Barber Asphalt Co., The, Philadelphia, Pa.
Scheel, William H., New York.

GLOVES—Electricians', Household and Surgeons'.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, Ohio.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

GRAPHITE.
Whittaker, Clark & Daniels, Inc., New York.

GRINDERS—Hard Rubber Dust.
Birmingham Iron Foundry, Derby, Conn.

GUAYULE RUBBER.
Baird Rubber & Trading Co., New York.
Continental Rubber Co., New York.
Wilson, Charles T., Co., Inc., New York.

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BUYERS' GUIDE

GUTTA PERCHA.
Astlett, H. A., & Co., New York.
Baird Rubber & Trading Co., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., New York.
Hankin, Geo., & Co., London, England.
Hardy, R. S., Co., New York.
Jacoby, Ernest, Boston, Mass.
Nordmann, Rassmann & Co., Hamburg, Germany.

GUTTA PERCHA TISSUE.
Bemis Associates, Inc., Watertown, Mass.

HARD RUBBER DUST.
Defiance Rubber Co., The, Defiance, Ohio.
Muehlstein, H., & Co., Inc., New York.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.

HARD RUBBER GOODS.
American Hard Rubber Co., New York.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Seamless Rubber Co., Inc., New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

HARD RUBBER GOODS.—Druggists' and Stationers' Sundries.
American Hard Rubber Co., New York.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Seamless Rubber Co., Inc., New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

HARD RUBBER GOODS—Electrical.
American Hard Rubber Co., New York.
Dominion Rubber Co., Ltd., Montreal, Canada.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

HAT BAGS.
New York Belting & Packing Co., New York.

HEATER PRESSES.
Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Nagle Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., The, Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

HEEL BURRS.
Sessions, J. H., & Son, Bristol, Conn.

HEEL NAILS.
United Shoe Machinery Corporation, Boston, Mass.

HEELS.
Firestone Tire & Rubber Co., Akron, Ohio.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

HEELS AND SOLES.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Dominion Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Ltd., Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

HOISTS.
Utility Mfg. Co., Cudahy, Wis.

HOISTS—Hydraulic.
Utility Manufacturing Co., Cudahy, Wis.
Watson-Stillman Co., The, New York.

HOSE—Armored.
Woven Steel Hose & Rubber Co., Trenton, N. J.

HOSE—Rubber.
Air Brake, Fire, Garden.
Pneumatic, Suction, Submarine. Vacuum, Dredging Sleeves.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Woven Steel Hose & Rubber Co., Trenton, N. J.

HOSE—Rubber Lined.
Cotton and Linen.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.

HOSE—Rubber Lined (Continued).
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Woven Steel Hose & Rubber Co., Trenton, N. J.

HOSE FITTINGS—Brass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Western Rubber Co., Goshen, Ind.
Yerdon, William, Fort Plain, New York.

HOSE LININGS.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Ltd., Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., New York.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

HOSE MACHINES.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
New England Butt Co., Providence, R. I.

HOSE WIRING MACHINES.
Adamson Machine Co., The, Akron, Ohio.

HOSPITAL SHEETINGS.
Archer Rubber Co., Milford, Mass.
Archer Strauss Rubber Co., Framingham, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Dominion Rubber Co., Ltd., Montreal, Canada.
Hodgman Rubber Co., Framingham, Mass.
Meade Rubber Co., Stoughton, Mass.
Omo Manufacturing Co., Middleton, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Schwarzwaelder Co., The, Philaphia, Pa.
Seamless Rubber Co., Inc., The, New Haven, Conn.
United States Rubber Co., New York.

HYDRAULIC PRESSES.
See Presses—Hydraulic.

ICE BAG CAPS.
Brass Goods Mfg. Co., Brooklyn, N. Y.

ICE BAGS.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, Ohio.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

IMPREGNATING EQUIPMENT—Vacuum Cloth.
Banner Machine Co., The, Columbiana, Ohio.
Devine, J. P., Co., Buffalo, N. Y.

INFUSORIAL EARTH—See Fossil Flour.

INNER TUBES.
Acme Rubber Mfg. Co., Trenton, N. J.
Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., The, Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Pennsylvania Rubber Co., Jeannette, Pa.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

INSULATED WIRE AND CABLES.
Kerite Insulated Wire & Cable Co., New York.
Pirelli, Milan, Italy.
United States Rubber Co., New York.

INSULATING COMPOUNDS.
Canfield Rubber Co., Bridgeport, Conn.
Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Robertson, H. H., Co., Pittsburgh, Pa.

INSULATING MACHINERY.
Adamson Machine Co., The, Akron, O.
Farrel Foundry & Machine Co., Ansonia, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Nagle Machine Co., Erie, Pa.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.

IRON OXIDE—See Red Oxide.

JAR RING CUTTING MACHINES.
Black Rock Mfg. Co., Bridgeport, Conn.

JAR RINGS.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.

BUYERS' GUIDE

JAR RINGS (Continued).

Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

JOINTS—Pipe.

Diamond Metal Products Co., St. Louis, Mo.
Flexo Supply Co., St. Louis, Mo.
Loomis, E. G., Newark, N. J.
Utility Manufacturing Co., Cudahy, Wis.

JOINTS—Swing.

Barco Manufacturing Co., Chicago, Ill.
Diamond Metal Products Co., St. Louis, Mo.
Flexo Supply Co., St. Louis, Mo.
Loomis, E. G. Newark, N. J.

LABORATORY EQUIPMENT.

Banner Machine Co., The, Columbiana, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Bristol Co., The, Waterbury, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

LAMPBLACK.

Binney & Smith Co., New York.
Cabot, Samuel, Boston, Mass.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

LATEX—Rubber.

Buckleton & Company, Ltd., Liverpool, England.
Hankin, Geo., & Co., London, England—Byles, W. B., New York, Agent.
Hardy, R. S., Co., New York.
Jacoby, Ernest, Boston, Mass.
Littlejohn & Co., Inc., New York.
United States Rubber Co., New York.

LATHES—Hard Rubber.

Adamson Machine Co., The, Akron, Ohio.

LATHES—Jar Ring.

Adamson Machine Co., The, Akron, Ohio.
Thropp, William R., Sons' Co., Trenton, N. J.

LEAD—Sublimed.

Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Wishnick-Tumpeer, Inc., New York.

LIME.

Chrystal, Charles B., Co., Inc., New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

LINERS—Treated.

Cleveland Liner & Mfg. Co., The, Cleveland, Ohio.

LITHARGE.

Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Wishnick-Tumpeer, Inc., New York.

LITHOPONE.

Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
New Jersey Zinc Sales Co., New York.
Scheel, William H., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

LOOMS—Hose.

Royle, John, & Sons, Paterson, N. J.

MACHINERY—Transmission Power.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

MAGNESIA—Calcined.

Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

MAGNESIUM CARBONATE.

Chrystal, Charles B., Co., Inc., New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.

MANDRELS—Circular.

Lowe, Clyde E., Co., Cleveland, Ohio.

MANDRELS—Sherardized.

New Haven Sherardizing Co., New Haven, Conn.

MANDRELS—Tube Splicing.

Williams Foundry & Machine Co., The, Akron, Ohio.

MASTICATORS.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

MATTING—Mats and Stair Treads.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

MICA.

Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

MILLS.

Adamson Machine Co., The, Akron, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Thropp, William R., Sons' Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio.

MINERAL RUBBER.

Barber Asphalt Co., Philadelphia, Pa.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Ohmiae Paint & Refining Co., Chicago, Ill.
Pioneer Asphalt Co., Lawrenceville, Ill.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

MIXERS—Automatic.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

MIXERS—Cement.

Banner Machine Co., Columbiana, Ohio.

MIXERS—Internal.

Birmingham Iron Foundry, Derby, Conn.

MOLD WASH.

Rubber Service Laboratories Co., The, Akron, Ohio.

MOLDS.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Akron Rubber Mold and Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Brockton Tool Co., Brockton, Mass.
Burroughs Co., The, Newark, N. J.
De Mattia Brothers, Inc., Clifton, N. J.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Kuhlke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Reynolds Machine Co., The, Massillon, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Terkelsen Machine Co., Boston, Mass.
Williams Foundry & Machine Co., Akron, Ohio.

MOLDS—Bead.

Akron Standard Mold Co., Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Utility Manufacturing Co., Cudahy, Wisconsin.

MOLDS—Druggists' Sundries.

De Mattia Brothers, Inc., Clifton, N. J.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.

MOLDS—Engraving Tire.

Banner Machine Co., The, Columbiana, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Reynolds Machine Co., The, Massillon, Ohio.
Utility Manufacturing Co., Cudahy, Wis.
Williams Foundry & Machine Co., The, Akron, Ohio.

MOLDS—Heels and Soles.

Brockton Tool Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Wade, Levi C., Lynn, Mass.

MOLDS—Inner Tube.

Akron Equipment Co., Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.

MOLDS—Mechanical Rubber Goods.

Adamson Machine Co., Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Mechanical Mold & Machine Co., Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Wade, Levi C., Lynn, Mass.

MOLDS AND CORES—Tires.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., Akron, Ohio.

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MOLDS AND CORES—Tires (Cont.)
Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Frank Foundry & Machine Co., Akron, Ohio.
Kuhlke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Reynolds Machine Co., The, Massillon, Ohio.
Williams Foundry & Machine Co., Akron, Ohio.

MOTORS—Electric.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

NIPPLES—Rubber.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, Ohio.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

OILS—Tar, Pine, Creosote, Resin, Turpentine.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

OILS—Vegetable.
Damascus Manufacturing Corporation, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

OLEATE—Lead.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Stamford Rubber Supply Co., Stamford, Conn.
Wishnick-Tumpeer, Inc., New York.

OSNABURGS.
Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Curran & Barry, New York.
Lane, J. H., & Co., New York and Chicago.

PACKING—Rubber.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

PATTERN MAKERS.
Adamson Machine Co., The, Akron, Ohio.
Farrel Foundry & Machinery Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

PETROLATUM.
Damascus Manufacturing Corporation, Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.

PINE TAR.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

PITCH.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Wishnick-Tumpeer, Inc., New York.

PLANTATION MACHINERY.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

PLASTOMETER.
Pusey and Jones Corporation, The, Wilmington, Delaware.

PLUMBERS' SUPPLIES.
Acme Rubber Mfg. Co., Trenton, N. J.
Canfield Co., H. O., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
Dominion Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

PONCHOS.
Archer Rubber Co., Milford, Mass.
Chicago Rubber Clothing Co., Racine, Wisconsin.
Clifton Manufacturing Co., Boston, Mass.
Hodgman Rubber Co., Framingham, Mass.
United States Rubber Co., New York.

PRESSES—Bead.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Williams Foundry & Machine Co., The, Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Belt.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.

PRESSES—Hydraulic.
Birmingham Iron Foundry, Derby, Conn.
French Oil Mill Machinery Co., Piqua, Ohio.
Nagle Machine Co., Erie, Pa.

PRESSES—Packing.
Black Rock Mfg. Co., The, Bridgeport, Conn.

PRESSES—Tiling.
Utility Manufacturing Co., Cudahy, Wis.

PRESSES—Tire.
Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., The, Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Tire Rimming.
Adamson Machine Co., The, Akron, Ohio.
Nagle Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.

PRESSES—Tire Vulcanizing.
Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, O.
Nagle Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Toggle.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Torkelson Machine Co., Boston, Mass.

PRESSES—Vulcanizing.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Burroughs Co., The, Newark, N. J.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
French Oil Mill Machinery Co., Piqua, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp, William R., Sons' Co., Trenton, N. J.
Utility Manufacturing Co., Cudahy, Wis.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

PROOFING.
Archer Rubber Co., Milford, Mass.
Archer Strauss Rubber Co., Framingham, Mass.
Canfield Rubber Co., Bridgeport, Conn.

PROOFING (Continued).
Dominion Rubber Co., Ltd., Montreal, Canada.
Du Pont, E. I., de Nemours & Co., Inc., Fairfield, Conn.
Hodgman Rubber Co., Framingham, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Schwarzwaelder Co., The, Philadelphia, Pa.
Toledo Auto Fabrics Co., Toledo, Ohio.
United States Rubber Co., New York.

PUMICE.
Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.

PUMPS.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
French Oil Mill Machinery Co., Piqua, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.

PUMPS—Centrifugal.
Southwark Foundry & Machine Co., Philadelphia, Pa.

PUMPS—Vacuum.
Devine, J. P., Co., Buffalo, N. Y.

RACKS AND FRAMES.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

RACKS—Stock.
De Mattia Brothers, Inc., Clifton, N. J.

RECLAIMED RUBBER.
Bloomingdale Rubber Co., New York.
Clapp, E. H., Rubber Co., Boston, Mass.
Defiance Rubber Co., Defiance, Ohio.
Nearpara Rubber Co., Trenton, N. J.
New Jersey Rubber Co., Lambertville, N. J.
Pequanoc Rubber Co., Butler, N. J.
Philadelphia Rubber Works, Philadelphia, Pa.
Rubber Regenerating Co., Naugatuck, Conn.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.
Stedman Products Co., South Braintree, Mass.
U. S. Rubber Reclaiming Co., Inc., New York.
Vulcan Recovery Co., Trenton, N. J.
Xylos Rubber Co., Akron, Ohio.

RECLAIMING MACHINERY.
Adamson Machine Co., The, Akron, Ohio.
American Process Co., New York.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Nagle Machine Co., Erie, Pa.
Struthers-Wells Co., Warren, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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RECLAIMING WATER SEPARATORS.
American Process Co., New York.
Devine, J. P., Co., Buffalo, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

RECORDING INSTRUMENTS—Pressure, Temperature.
Bristol Co., The, Waterbury, Conn.
Taylor Instrument Cos., Rochester, N. Y.

RED OXIDE.
Binney & Smith Co., New York.
Chrystal, Charles B., Co., Inc., New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Huber, J. M., Inc., New York.
McNulty, Joseph A., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

REFINERS.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

REPAIR STOCK.
Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., New York.
General Tire & Rubber Co., Akron, Ohio.
United States Rubber Co., New York.

RESIN.
Scheel, William H., New York.
Wishnick-Tumper, Inc., New York.

RETREADING EQUIPMENT—Tire
De Mattia Brothers, Inc., Clifton, N. J.

RINGS—Bead Setting
Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.

RINGS—Mold Side.
De Mattia Brothers, Inc., Clifton, N. J.

RIVETS.
Sessions, J. H., & Son, Bristol, Conn.

ROLLERS AND STITCHERS—Hand.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Wellman Co., Medford, Mass.

ROLLS—Chilled.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.

ROLLS—Chilled (Continued)
Curtis & Marble Mch. Co., Worcester, Mass.
Farrel Foundry & Machinery Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Textile-Finishing Machinery Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

ROLLS—Engraving.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

ROLLS—Rubber Covered.
Acme Rubber Mfg. Co., Trenton, N. J.
Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

ROLLS—Wringer.
Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

ROSIN.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Wishnick-Tumpeer, Inc., New York.

ROTTEN STONE.
Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.

RUBBER—Brokers.
Buckleton & Company, Ltd., Liverpool, England.
Chipman, R. L., New York.
Dunbar, F. W., & Co., Inc., New York.
Dunbar, J. Frank, Co., Inc., New York.
Hardy, Roger S., New York.
Henderson Brothers & Co., Inc., New York.
Hentz, H., & Co., New York.
Jacoby, Ernest, Boston, Mass.

RUBBER—Importers and Exporters.
Araujo, J. G., & Co., Ltd., Manaos, Brazil, S. A.
Astlett, H. A., & Co., New York.
Baird Rubber & Trading Co., New York.
Chalifin, Joseph, & Co., Inc., New York.
Continental Rubber Co., New York.
Hankin, Geo., & Co., London, England.
Hirsch, Adolph, & Co., New York.
Littlejohn & Co., Inc., New York.
Muehlstein, H., & Co., Inc., New York.

RUBBER—Importers and Exporters (Continued)
Nordmann, Rassmann & Co., Hamburg, Germany.
Wilson, Charles T., Co., Inc., New York.

RUBBER—Washed and Dried.
Acushnet Process Co., New Bedford, Mass.
Araujo, J. G., & Co., Ltd., Manaos, Brazil, S. A.
Astlett, H. A., & Co., New York.
Littlejohn & Co., Inc., New York.

RUBBER BANDS.
Davol Rubber Co., Providence, R. I.
Easthampton Rubber Thread Co., Easthampton, Mass.
Hodgman Rubber Co., Framingham, Mass.
Murray Rubber Co., Trenton, N. J.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

RUBBER COATED CLOTHS.
Archer Rubber Co., Milford, Mass.
Archer Strauss Rubber Co., Framingham, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Chicago Rubber Clothing Co., Racine, Wisconsin.
Clifton Manufacturing Co., Boston, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Du Pont, E. I., de Nemours & Co., Inc., Fairfield, Conn.
Hodgman Rubber Co., Framingham, Mass.
Mechanical Fabric Co., Providence, R. I.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Schwarzwaelder Co., The, Philadelphia, Pa.
Toledo Auto Fabrics Co., Toledo, Ohio.
United States Rubber Co., New York.

RUBBER COVERING MACHINES.
New England Butt Co., Providence, R. I.

RUBBER SCRAP CUTTERS.
Taylor, Stiles & Co., Riegelsville, N. J.

RUBBER—Substitutes.
Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Jacoby, Ernest, Boston, Mass.
Scheel, William H., New York.
Stamford Rubber Supply Co., Stamford, Conn.
Tyson Bros., Inc., Woodbridge, N. J.

SAFETY SWITCHES—Electrical.
General Electrical Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

SCLEROSCOPES.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

SCRAP RUBBER.
Birkenstein, S., & Sons, Chicago, Ill.
Chalifin, Joseph, & Co., Inc., New York.
Cummings, Wm. H., & Sons, New York.
Muehlstein, H., & Co., Inc., New York.
Watteiez & Co., Paris, France.

SECOND-HAND MACHINERY.
Albert, L., & Son, Trenton, N. J.
Barry, Lawrence N., Boston, Mass.
Cleveland Equipment & Engineering Co., Cleveland, O.
Surplus Trading Corp., The, Newark, N. J.
United Rubber Machinery Exchange, Newark, N. J.
United States Rubber Co., Detroit, Michigan.

SEWING MACHINES.
Curtis & Marble Machine Co., Worcester, Mass.
Hamlin Machine Co., Lynn, Mass.

SHEET METAL SPECIALTIES.
Brass Goods Mfg. Co., Brooklyn, N. Y.

SHEETINGS.
Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Lane, J. H., & Co., New York and Chicago.

SHELLAC.
Scheel, William H., New York.

SHERARDIZING.
New Haven Sherardizing Co., New Haven, Conn.

SILICA.
Chrystal, Charles B., Co., Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

SKIVING MACHINES.
Hamlin Machine Co., Lynn, Mass.
Nagle Machine Co., Erie, Pa.
United Shoe Machinery Corporation, Boston, Mass.

SLATE FLOUR.
Chrystal, Charles B., Co., Inc., New York.

SLITTERS—Belting Duck.
Birmingham Iron Foundry, Derby, Conn.
Cameron Machine Co., Brooklyn, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.

SLITTING AND REWINDING MACHINES.
Cameron Machine Co., Brooklyn, N. Y.

SOAP BARK.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

SOAPSTONE.
Binney & Smith Co., New York.
Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

SOFTENER—Rubber.
Colledge, E. W., Inc., Jacksonville, Fla.
Damascus Manufacturing Corporation, Cleveland, Ohio.
Hall, C. P., Co., The, Akron, Ohio.
Rubber Service Laboratories Co., The, Akron, Ohio.
Vanderbilt, R. T., Co., New York.

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SOLING—Crêpe.
Buckleton & Company, Ltd., Liverpool, England.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hankin, Geo., & Co., London, England.
Henderson Brothers & Co., Inc., New York.
Jacoby, Ernest, Boston, Mass.
Littlejohn & Co., Inc., New York.

SOLVENT RECOVERY APPARATUS.
Devine, J. P., Co., Buffalo, N. Y.

SPLICING COMPOUNDS.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

SPONGE PRODUCTS—Rubber.
Faultless Rubber Co., Ashland, O.
Oak Hill Rubber Co., Oak Hill, O.
Toycraft Rubber Co., The, Ashland, O.

SPONGES—Rubber.
Faultless Rubber Co., Ashland, O.
Oak Hill Rubber Co., Oak Hill, O.

SPREADERS.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
New England Butt Co., Providence, R. I.
Textile-Finishing Machinery Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

STAMP GUM.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
United States Rubber Co., New York.

STARCH—Corn.
Wishnick-Tumpeer, Inc., New York.

STEARIC ACID.
Binney & Smith Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.

STEEL STAMPINGS.
Sessions, J. H., & Son, Bristol, Conn.

STITCHERS.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

STOCK SHELLS.
Gammeter, W. F., Co., The, Cadiz, Ohio.
Lowe, Clyde E., Co., Cleveland, Ohio.
New Haven Sherardizing Co., Hartford, Conn.

STOPPERS—Rubber.
Canfield Rubber Co., Bridgeport, Conn.
Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, O.
New York Belting & Packing Co., New York.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

STRAINING MACHINES.
Nagle Machine Co., Erie, Pa.
Royle, John, & Sons, Paterson, N. J.

STRETCHERS—Belting.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.

SULPHUR.
Battelle & Renwick, New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Southern Acid & Sulphur Co., St. Louis, Mo.
Stauffer Chemical Co., Houston, Texas.
White, T. & S. C., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

SULPHUR CHLORIDE.
Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Stamford Rubber Supply Co., Stamford, Conn.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer, Inc., New York.

SYRINGE SHUT OFFS.
Brass Goods Mfg. Co., Brooklyn, N. Y.

SYRINGES—Fountain.
Davidson Rubber Co., Boston Mass.
Davol Rubber Co., Providence R. I.
Faultless Rubber Co., Ashland, O.
United States Rubber Co., New York.

TABLES—Stripping.
Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

TALC.
Binney & Smith Co., New York.
Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Vanderbilt, R. T., Co., Inc., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

TAPE—Adhesive.
Bemis Associates, Inc., Watertown, Mass.

TAPE—Cloth Friction.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Dominion Rubber Co., Ltd., Montreal, Canada.
Home Rubber Co., Trenton, N. J.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

TAPE—Insulating.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

TAPE—Tire.
Adams, H. J., Co., The, Akron, Ohio.

TECHNOLOGISTS—Consulting, Rubber.
Dunbar, Wilmer, Greensburg, Pa.
Haertel, H. R., Wrentham, Mass.
Maywald, F. J., Belleville, N. J.
Norris, Webster, Hempstead, N. Y.
Olin, R. R., Laboratories, Akron, Ohio.

TENTERING MACHINES.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.

TESTING MACHINES.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

THERMOMETERS.
Bristol Co., The, Waterbury, Conn.
Taylor Instrument Cos., Rochester, N. Y.

THREAD—Rubber.
Easthampton Rubber Thread Co., Easthampton, Mass.
Mechanical Fabric Co., Providence, R. I.
United States Rubber Co., New York.

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TILING.

Dominion Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Ltd., Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., The, Passaic, N. J.
Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
Stedman Products Co., South Braintree, Mass.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

TIRE BUILDING MACHINES.

Banner Machine Co., The, Columbiana, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Utility Manufacturing Co., Cudahy, Wis.

TIRE FABRICS.

Adams, H. J., Co., The, Akron, Ohio.
Bibb Mfg. Co., Macon, Ga.
Brighton Mills, Passaic, N. J.
Callaway Mills, Inc., New York.
Cannon Mills, New York.
Lane, J. H., & Co., New York and Chicago.
Willingham Cotton Mills, Macon, Ga.

TIRE MACHINE DRUMS.

Gammeter, W. F., Co., The, Cadiz, Ohio.

TIRE PRESSES.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., The, Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

TIRE REBUILDING AND REPAIR EQUIPMENT.

Akron Equipment Co., Akron, Ohio.
Bigge Boiler Works Co., The, Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.

TIRE REBUILDING AND REPAIR EQUIPMENT—(Continued)

Franz Foundry & Machine Co., Akron, Ohio.
Williams Foundry & Machine Co., Akron, Ohio.

TIRE WRAPPING MACHINES—Paper.

Terkelsen Machine Co., Boston, Mass.

TIRES—Auto.

Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Pennsylvania Rubber Co., Jeannette, Pa.
Pirelli, Milan, Italy.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

TIRES—Baby Carriage.

Gutta Percha & Rubber, Ltd., Toronto, Canada.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

TIRES—Bicycle.

Fisk Rubber Co., Chicopee Falls, Mass.
Pennsylvania Rubber Co., Jeannette, Pa.

TIRES—Motorcycle.

Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
Pennsylvania Rubber Co., Jeannette, Pa.

TIRES—(Solid) Truck.

Dominion Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
United States Rubber Co., New York.

TREAD CUTTERS.

Utility Mfg. Co., Cudahy, Wis.

TREAD-MAKING MACHINES

Birmingham Iron Foundry, Derby, Conn.
Vaughn Machinery Co, The, Cuyahoga Falls, Ohio.

TRIMMERS—Bead.

Banner Machine Co., The, Columbiana, Ohio.

TRIMMERS—Belt.

Banner Machine Co., The, Columbiana, Ohio.
Morris, T. W., Chicago, Ill
United Shoe Machinery Corp., Boston, Mass.
Wills, Arthur Jackson, North Brookfield, Mass.

TUBE WRAPPING MACHINES.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

TUBING.

Acme Rubber Mfg. Co., Trenton, N. J.
Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.

TUBING (Continued).

Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, O.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
Seamless Rubber Co., Inc., The, New Haven, Conn.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Whitall Tatum Co., New York.

TUBING MACHINES.

Adamson Machine Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Nagle Machine Co., Erie, Pa.
Royle, John, & Sons, Paterson, N. J.

VALVE BALLS.

Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., The, Passaic, N. J.
Quaker City Rubber Co., Philadelphia, Pa.
Western Rubber Co., Goshen, Ind.

VALVES, STEAM AND PUMP.

Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES—Hydraulic.

Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES—Two Pressure.

Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES AND CAPS—Tire.

Schrader's, A., Sons, Inc., Brooklyn, N. Y.

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VARNISHES—Rubber.
Monroe Sander Corporation, Long Island City, N. Y.

VARNISHING MACHINES.
Birmingham Iron Foundry, Derby, Conn.

VULCANIZERS.
Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Biggs Boiler Works Co., Akron, Ohio.
Devine, J. P., Co., Buffalo, N. Y.
Southwark Foundry & Machine Co., Philadelphia Pa.
Struthers-Wells Co., Warren, Pa.
Thropp, William R., Sons' Co., Trenton, N. J.
Utility Manufacturing Co., Cudahy, Wis.
Williams Foundry & Machine Co., Akron, Ohio.
Wood, R. D., & Co., Philadelphia, Pa.

VULCANIZERS—Individual Tire.
Akron Standard Mold Co., Akron, Ohio.
De Mattia Brothers, Inc., Clifton, N. J.
Utility Manufacturing Co., Cudahy, Wis.

WASHER SETTING MACHINE FOR HEEL MOLDS.
Utility Manufacturing Co., Cudahy, Wis.

WASHERS—Crude Rubber.
Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Nagle Machine Co., Erie, Pa.
Thropp, William R., Sons' Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

WASHERS—Rubber Heels.
Sessions, J. H., & Son, Bristol, Conn.

WATER BOTTLES.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Dominion Rubber Co., Ltd., Montreal, Canada.
Faultless Rubber Co., Ashland, Ohio.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

WAX.
Damascus Manufacturing Corporation, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.

WAX (Continued).
Scheel, William H., New York.
Vanderbilt, R. T., Co. New York.

WAX—Montan.
Wishnick-Tumpeer, Inc., New York.

WHEELS—Elastic Emery.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.

WHITING.
Chrystal, Charles B., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Southwark Manufacturing Co., Camden, N. J.
Taintor Co., The, New York.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt R. T., & Co., Inc., New York.
Weeping Water S. Co., The, Weeping Water, Neb.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

WIRE—Lead Covered.
United States Rubber Co., New York.

WIRE—Rubber Insulated.
United States Rubber Co., New York.

WIRE WRAPPING MACHINES.
Terkelson Machine Co., Boston, Mass.

WOOD FLOUR.
Grasselli Chemical Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

WRAPPING MACHINES—Cloth.
Terkelson Machine Co., Boston, Mass.

ZINC OXIDE.
Chrystal, Charles B., Co., Inc., New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
New Jersey Zinc Sales Co., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

ZINC SUBSTITUTE.
Scheel, William H., New York.

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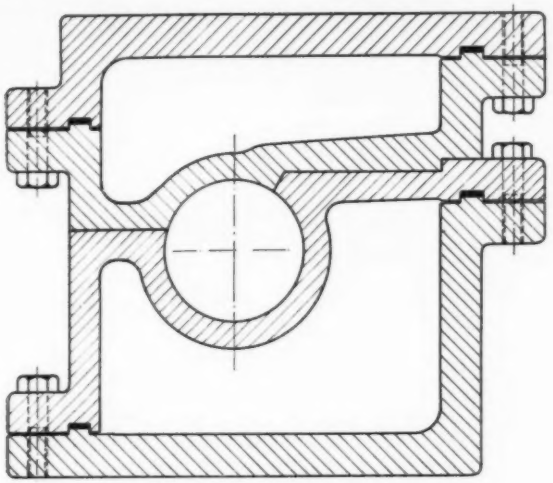
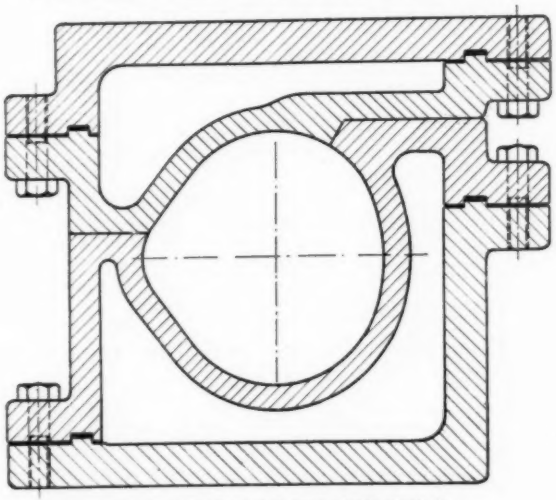


No 2 STEAM CHEST WITH 29x440 MOLD



No2 STEAM CHEST WITH 32x620 MOLD

FLYNN
SHAPE C
TUBE
MOLDS

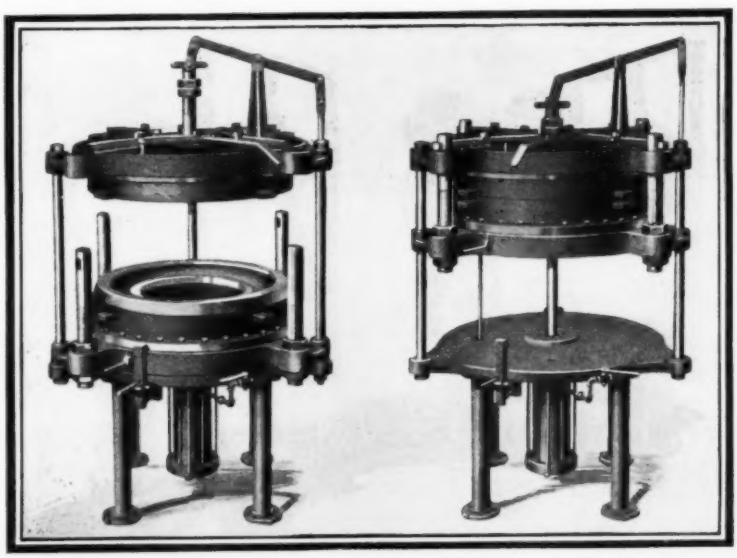
Interchangeable Molds Bring New Advantages

By using the new Flynn Interchangeable Tube Molds, four sizes of steam chests can now accommodate 56 sizes of molds (made in the form of a shell).

This interchangeable feature brings a new flexibility and an economy both in the first cost of the equipment and its operation.

Further economy is reached by handling all 56 Flynn Interchangeable Tube Molds in only two Akron Equipment Quick Acting Presses—the 32 x 675 and 42 x 9 sizes. By carrying an extra steam chest of each size the mold shell can be placed in the steam chest at your mold storage. The press need be shut down only about 30 minutes while substituting a different size.

In case any size of tube becomes obsolete you lose only the cost of a shell. The press and steam chests may be used for products other than inner tubes.



This shows the Flynn Tube Mold in the Akron Equipment Company's special press open and closed. Its horizontal position enables the operator to work in the most natural position. It not only conserves floor space but insures nearly 100% perfect tubes at a minimum cost.

Average 99 Tubes Perfect Out of 100

That average shows the successful molded tube production with Flynn Molds during the past 12 months. With such a record, further experimenting or search for equipment should be unnecessary. Try Flynn Molds in your own plant under your own conditions. They will leave no doubt in your mind as to their efficiency.

Write today for the authoritative bulletin—"Modern Tube Production Methods" by Mr. M. A. Flynn. It is both interesting and convincing.

The Akron Equipment Co.

East Exchange at Annadale
Akron, Ohio

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